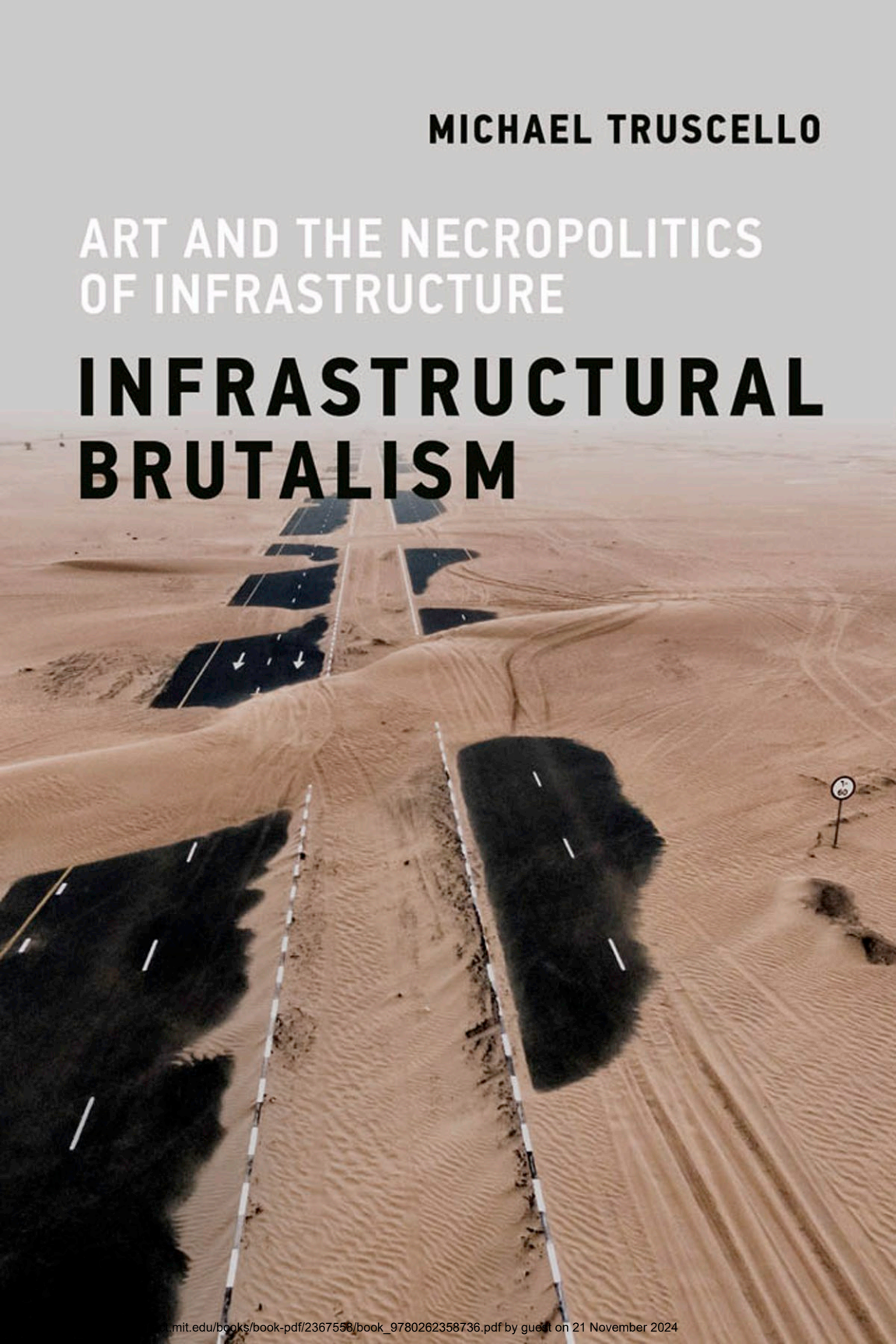
MICHAEL TRUSCELLO

INFRASTRUCTURAL BRUTALISM

ART AND THE NECROPOLITICS OF INFRASTRUCTURE



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Infrastructural Brutalism

Art and the Necropolitics of Infrastructure

Michael Truscello

The MIT Press
Cambridge, Massachusetts
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Of course, all of the mistakes and bad judgment exhibited by me in this book are entirely my fault. This book should be read in the manner in which most of it was written: listening to Neurosis and Appalachian Terror Unit.

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Michael Truscello, "The New Topographics, Dark Ecology, and the Energy Infrastructure of Nations: Considering Agency in the Photographs of Edward Burtynsky and Mitch Epstein from a Post-Anarchist Perspective," *Imaginations: Journal of Cross-Cultural Image Studies* 3, no. 2 (2012), https://journals.library.ualberta.ca/imaginations/index.php/imaginations/article/view/27253.

Michael Truscello and Uri Gordon, "Whose Streets? Anarchism, Technology, and the Petromodern State," *Anarchist Studies* 21, no. 1 (2013), 9–27.

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Introduction: The Paver of Modern Life

> Reality is a parking lot in Qatar. Reality is an airstrip in Malawi.
>
> Meanwhile the expressway encloses, the expressway round and around the perimeters like wagon trains circling the bonfire, all of them, guns pointed, Busby Berkeley in the night sky.
>
> —Sina Queyras, *Expressway*

> Perhaps our age will be known to the future historian as the age of the bulldozer and the exterminator: and in many parts of the country the building of a highway has about the same result upon vegetation and human structures as the passage of a tornado or the blast of an atom bomb.
>
> —Lewis Mumford

In J. G. Ballard's 1974 novel *Concrete Island*, a wealthy young architect named Robert Maitland crashes his Jaguar in central London. The car smashes through a roadside barrier, plunges down a grassy embankment, and lands in a "small traffic island, some two hundred yards long and triangular in shape, that lay in the waste ground between three converging motorway routes."[1] The island, which is "sealed off from the world around it by the high embankments on two sides and the wire-mesh fence on its third,"[2] reproduces a familiar milieu in Ballardian literature: the overdeveloped and psychologically precarious modern environment of industrial capitalism. While *Concrete Island* is, in the most general sense, simply a recreation of *Robinson Crusoe* in the context of a modern metropolis, with Maitland dramatically "exited from reality" in a quick succession of "a defective tyre-wall" and "a bang on the head,"[3] it exemplifies what I am calling *infrastructural brutalism* because, unlike Ballard's more famous novels of

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this era, *Crash* (1973) and *High-Rise* (1975), *Concrete Island* isolates its action to "a forgotten traffic island,"[4] and so it takes place within the spaces of concrete infrastructure instead of the habitations that infrastructure usually connects. Here, infrastructure isolates, toxifies, dispossesses, and immobilizes, contrary to the more common infrastructural tropes of connectivity and mobility. As a subject of infrastructural brutalism, Maitland breathes the "warm, exhaust-filled air . . . his entire nervous system [is] scraped by invisible knives,"[5] reminiscent of contemporary Shanghai residents caught in the too-common event of an "airpocalypse." There is no respite from the "maze of concrete causeways,"[6] and he hates the passing motorists. The world of concrete infrastructure is a "nightmare" of the "slumbering" European continent.[7] Decades before scholars articulated the concept of "automobility" as an assemblage of cars, roads, laws, and other systems and objects that make motoring possible, Ballard asked: "Was the entire island an extension of the Jaguar, its windshield and windows transformed by his delirium into these embankments?"

Injured from the crash, Maitland fashions a crutch from an exhaust pipe, then recovers water from the windshield washers. Maitland must survive in a space that resembles so many contemporary urban wastelands:

> No grass grew under the overpass. The damp earth was dark with waste oil leaking from the piles of refuse and broken metal drums on the far side of the fence. The hundred-yard-long wire wall held back mounds of truck tyres and empty cans, broken office furniture, sacks of hardened cement. Builder's forms, bales of rusty wire and scrapped engine parts were heaped so high that Maitland doubted whether he would be able to penetrate this jungle of refuse even if he could cut through the fence.[8]

While Ballard's emphasis falls on the unpreparedness of the typical urbanite to deal with a technological breakdown—something the literature of infrastructure studies routinely foregrounds when it discusses the "invisibility" of infrastructure—his novel also creatively imagines the transversal ecological, political, and psychological brutality of an environment constructed with copious amounts of concrete and shaped by capitalist propensities. Studies of infrastructure often isolate these components—the ecological devastation of global urbanization, the racist and classist structures of large infrastructure projects, and the manic-depressive qualities of capitalist realism. But here in the form of a novel, the transversal lines of infrastructural brutalism assemble, multiply, cut across, and generally defy

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disciplinary thought and praxis. What Ballard calls "that whole system of comfortable expectations [Maitland] had carried with him"[9] to the concrete island, an array of assumptions based on the uninterrupted functioning of industrial infrastructure in a metropolitan center in the Global North, is exposed for its sociopolitical precarity when the subject of infrastructural brutalism is forced to confront the material existence of infrastructure. Suddenly "the concrete overpass and the system of motorways in which he was marooned had begun to assume an ever more threatening size."[10] Maitland's accident, like the art of infrastructural brutalism, makes visible the intersecting and interdisciplinary lines of an exposed-concrete aesthetic and its necropolitical valences,[11] and refuses to reconcile these relations in a complacent narrative of progress or anticivilizational utopianism. Unlike the conventional depictions of infrastructure that foreground reductive visions of improved mobility and social connectivity, the walls and highways of *Concrete Island* position an infrastructural subject who is trapped, isolated, poisoned, and starved by his overdeveloped surroundings. Infrastructure here is not a panacea that unites but a manufactured miasma of despair, toxicity, and death. "Streets," wrote English poet and dramatist Heathcote Williams, "once the open forum of daily life, / Are now the open sewers of the car cult."[12] For a nonfiction example, consider that auto accidents are the leading cause of death for Americans under 40; almost 1 percent of Americans will die in a car crash.[13] Edward Humes puts the death toll of car crashes in the United States into context: "One year of car crash injuries and deaths in the U.S. is greater than all the [U.S. military] dead and wounded from the *entire duration* of all those wars [World War I, World War II, Vietnam, Korea, Iraq, Afghanistan, the War of 1812, and the American Revolution] combined, with numbers to spare to cover all Union Army dead and wounded from the Civil War as well."[14] Worldwide, 1.25 million people die in car accidents annually, with as many as 50 million injuries related to automobility in the same period.[15] That number does not include the premature deaths caused by air pollution, climate change, ecological degradation caused by paved roads, and other impacts of automobility. That number also does not include nonhuman animal deaths directly caused by roads: in the United States alone, over 1 million nonhuman animals die on roads every day; over the past 30 years, vertebrates in the US were more likely to die on roads than because of hunting.[16] Around the world, roads usher a variety of habitat fragmentation and destruction: "In

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equatorial Africa's Congo Basin, logging roads have attracted a new wave of elephant poachers; in Siberia, road expansion has caused an outbreak of wildfires; in Suriname, roads invite illegal gold mining; and in Finland, so many reindeer are killed by cars that herders have considered marking the animals with reflective paint."[17] Within twenty years, most fragmented habitats lose half of their animal and plant species, and over 70 percent of the world's forests are now within a kilometer of a habitat edge. Many overdeveloped nations are already concrete islands, and the infrastructure agenda proposed by capitalism for the coming decades will eliminate the few escape routes remaining.

Maitland's decision "to dominate the island and harness its limited resources," something he comes to see as "a more important goal than escaping,"[18] marks the dystopian moment in *Concrete Island*, the "will to survive" that might be equated with Lauren Berlant's "cruel optimism"[19] because his survivalist impulse embraces industrial refuse and its dead spaces as something to dominate, something to live with and for, much like the global urbanization project and its promises of "green" and "resilient" cities, even as the global ecological collapse advances and surpasses planetary boundaries essential to human existence. This is also what I am calling infrastructural brutalism: the historical context in which industrial capitalism has met the limits of its expansion and domination, and yet continues to press for unprecedented commitments to build more oil pipelines, more large dams, more roads, more paved surfaces than at any time in human history. Many subjects of this brutal world have internalized its suicidal features, much as Maitland eventually equates the concrete island with himself: "Identifying the island with himself, he gazed at the cars in the breaker's yard, at the wire-mesh fence, and the concrete caisson behind him. These places of pain and ordeal were now confused with pieces of his body."[20] Infrastructural brutalism manifests in an aggregation of industrial trajectories producing cancerous bodies, polluted lungs, atrophied muscles, and depressed and anxious brains.[21] Often the assemblage of brutal maladies is so dense and prolonged that remedies begin by segregating infrastructure from the list of inimical objects and relations. This oversight is produced by capitalist priorities: instead of not building another oil pipeline, the emphasis of state capitalism is on building *better* pipelines; instead of expertly decommissioning all nuclear reactors, the emphasis of state capitalism is on maintaining an unsustainable level of energy consumption

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that makes nuclear reactors appear necessary (and their waste appear like a reasonable risk); instead of recognizing that planetary ecological limits have been breached, state capitalism advocates more industrial infrastructure on an unprecedented scale. This book is designed to articulate some of the necropolitical contours and history of infrastructural brutalism through the examination of artistic forms that engage infrastructure as their central focus—literature about hydroelectric projects that produce drowned towns, films about traveling on paved roads, photography of the energy landscapes past and present, and narratives of death trains from the colonial period to the present eco-apocalypse. The approach to infrastructure studies in this book draws inspiration from Stephanie Wakefield and Glenn Dyer, who argue that the study of infrastructure ought to "reorient the way we think about power, life, and revolution, and to set out adequate starting points from which to begin rebuilding all three."[22] If we do not reconsider how infrastructure conjoins "power, life, and revolution," the capitalist expansion of infrastructure planned for the next 20 years will ensure a prolonged catastrophe of accelerated climate change and multiple converging ecological crises in which it will make sense to consider the possibility of the near-term extinction of the species.

Many of the examples of the aesthetics of infrastructural brutalism in this book derive from the literature, film, and photography of the United States. This is at least in part because I agree with Franco "Bifo" Berardi's assessment of the United States as "the homeland of necro-aesthetics."[23] Author Henry Miller once remarked that he had "walked the streets" of many countries around the world but nowhere did he feel "so degraded and humiliated" as he did in the US: "I think of all the streets in America combined as forming a huge cesspool, a cesspool of the spirit in which everything is sucked down and drained away to everlasting shit."[24] The US combines the global reach of many of its artistic endeavours with a domestic history of slavery and genocide, as well as the use of the atomic bomb and the unparalleled distribution of contemporary necropower through the Pentagon.[25] While the necropolitial legacy of the US will soon be surpassed by China, there is no better consistent exemplar of necro-aesthetics than US history; to the list of atrocities above, I wish to add the necrostructural achievements of modern industrial infrastructure in the US, especially its pioneering developments of hydroelectric power and paved roads. As the world plunges into what Bifo calls "the posthistorical dimension of pure

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horror,"[26] it remains an essential task to trace the historical and contemporary necropolitical contours of this horror, a horror I am calling infrastructural brutalism, to confront as best we can, in what little time remains, the structural integrity and persistence of the horror. Because so much of the scholarship on infrastructure emerges from the Global North, it is a scholarship that rarely accounts for the necropolitical features of infrastructure. How industrial infrastructure condemns millions of humans and nonhuman animals to death, in its construction and operation, is the "power and . . . capacity to dictate who may live and who must die," as Mbembe describes necropolitics.[27] Since the majority of those "who may live" by this infrastructure now depend on it for survival, few of them will frame infrastructure as a death-dealing assemblage. But now that the planet has clearly crossed over into various forms of ecological collapse, industrial infrastructure is obviously the central feature of the unevenly distributed horror in which life now exists, and, of course, long before global ecological collapse was a reality, the victims of infrastructural necropolitics were well aware of its implications.

Hyperindustrialism and the Brutal Encounter

Infrastructural brutalism emerges concomitant with what Bernard Stiegler calls "hyper-industrialism," the condition in which "more than ever we are experiencing the *industrialization of all things*."[28] This hyperindustrialist era manifests in many ways; for example, while Silicon Valley has deployed nautical metaphors to describe the economic and intellectual mobility of the Internet, a more conventional industrial form of trade, overseas shipping, has proliferated. Seaborne trade has increased fourfold from 1970 to the present, and two-thirds of US oil supplies arrive by ship.[29] Hyperindustrialism continues to inform global capitalism, despite performative talk of "greening" capitalism, or building "resilient" cities, or the supposed transformation into a "postindustrial" world. The escalation of environmental, social, and psychological brutality under hyperindustrial expansion emanates from many forms of structural oppression (colonialism, white supremacy, homophobia, speciesism, etc.), and the current study of infrastructural brutalism does not assume primacy among those forms; however, infrastructural brutalism provides the semio-material support for most systems of oppression under industrial capitalism. The "critical" infrastructure

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that sustains life in industrialized societies also generates necropolitical assemblages, death-dealing dispossession, and structural oppressions. The mythology of the postindustrial society has furnished ideological cover for the ecological devastation of the neoliberal era of capitalism, the post-1950 destruction that scientists have described as the Great Acceleration, "the most rapid transformation of the human relationship with the natural world in the history of humankind."[30] Saskia Sassen eloquently describes the neoliberal mesh of extractive industries and high finance that produced the current global order of destruction as "a world where complexity too often tends to produce elementary brutalities."[31] Bifo frames the neoliberal era in terms of the 60 percent increase in suicide rates that accompanied the postwar period of neoliberalism:

> In the past forty-five years, two new phenomena have penetrated human bio-sociality: the neoliberal acceleration of the economic pace and the digital mutation of cognitive and emotional stimulation. It is these two trends that are at the root of the growing suicide epidemic. An epidemic of misery is spreading on the planet while the absolutism of financial capitalism asserts its right to total control over our lives. As bio-semiocapitalism infiltrates the conscious organisms' nervous cells, it simultaneously inoculates these very organisms with a necropolitical rationale—a morbid sentiment that is progressively infesting the collective unconscious, culture and sensibility at large. The biopolitical effect of semiocapitalism—or, better said, the thanato-political effect of semiocapitalism—consists of capturing cognitive activity and of subjecting the linguistic animal's faculty of expression to the sleepless, aggressive dynamics of the labour market. Exploitation, competition, mobbing, precariousness and layoffs are no longer perceived as a result of conflictual social relations. On the contrary, they are internalised as deficiencies of the self, as personal inadequacies. The unceasing restructuring and reorganisation of work is experienced as a brutality and humiliation, too.[32]

It is from within this ecological collapse and semiocapitalist misery, this attenuated expansion of industrial blight, that most humans relate to industrial infrastructure, its aesthetics and politics. Charles Thorpe describes the necroculture of capitalism as "a decaying system stubbornly resisting its slow death": "Its life support is imperialist war, ecological destruction, police-state surveillance and brutality, the degradation of culture by corporate mass media, and a mass psychology of hopelessness."[33] It is from within this context, then, that potential forms of liberation must be theorized and practiced.

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The state form provides material and logistical support for hyperindustrial expansion, and in this capacity over the past century the state has become suicidal. From the military bunkers of World War II to the large dams, highways, and assorted industrial infrastructure that define the contemporary urban milieu and its supporting assemblages, the suicidal state exhibits a brutal architecture of flows and accretion whose collective consequence is the construction of a global necropolis. In 2006, J. G. Ballard wrote in the *Guardian* about his experience of Utah Beach and the concrete fortifications of the Atlantic Wall. The author who had immortalized brutalist architecture three decades earlier in the vicious class warfare of *High-Rise* was reminded of the "run-down tower blocks and motorway exit ramps" in England as he surveyed the blockhouses and stained concrete walls of Utah Beach.[34] To Ballard, the concrete fortifications that face the English Channel are "a set of concrete tombs whose dark ghosts haunted the brutalist architecture so popular in Britain in the 1950s."[35] Ballard's association of wartime infrastructure and the postwar architectural form that has experienced a resurgent popularity over the past decade echoes the famous analysis of Paul Virilio's *Bunker Archeology* (original French edition 1975) in which Virilio refers to the abandoned German bunkers on the coast of France as an "archeology of the brutal encounter," an architectural form indicative of the mass murder it anticipates. "From the point of impact at collision to the highway pile-up," Virilio wrote, "the infrastructure set up the *duel*";[36] indeed, 30 years before Ballard's reflections on Utah Beach, Virilio used synonymous language in describing the bunkers as "funerary monuments of the German dream."[37] Contemporary industrial societies are so enamored with infrastructure as sources of mobility, technological advance, and economic prosperity that their necropolitical valences rarely enter the discussion, and Virilio's and Ballard's association of infrastructure and death occur only within the context of tactical military infrastructure and an architectural form long condemned and abandoned by bourgeois tastemakers. While Virilio's concern rested on speed and its infrastructures, his idiom—"the *brutal* encounter"—would be considered by neoliberal observers as specific to the predigital era, before the annihilating implosion of speed came to be associated with nanoseconds and network topologies. Virilio was one of the earliest critical theorists to understand the transformative power of industrial infrastructure, though his contribution remains largely unacknowledged in infrastructure studies. In *Bunker Archeology*, he

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establishes the infrastructural quality of his dromological perspective: "the arrival of a new infrastructural-vehicular system always revolutionizes a society in overthrowing both its sense of material and its sense of social relationships—thus the sense of the entire social space. The superior speed of various means of communication and destruction is, in the hands of the military, the privileged means for a secret and permanent social transformation, a projectile for the destruction of the social continuum, a weapon, an *implosive*."[38] Curiously, he would not foreground the "implosive" dynamic of the highway system in his discussion of the suicidal state, which would focus instead on political parties such as the Nazis and the Khmer Rouge turning the state form suicidal.

Virilio's discussion of the suicidal state emerges in his 1976 book *The Insecurity of Territory*. In the context of what he calls total peace, or a "sinister period"[39] of deterrence that enables a permanent threat of war, Virilio argues that the "the life of states, their destiny, will be subordinated to general strategy. . . . Thus, as with total war, it will be possible to wage total peace from above and afar."[40] Significantly, "the technological programs advanced by peace and war tend to overlap," as nuclear deterrence and capitalist globalization become "frames of integration, structures already chosen to which all the rest must come to be subordinated."[41] The Germans, argues Virilio, were the first to live total war, and thus became a model for the Allies to study. The outcome of total war and total peace is the suicidal state, a condition in which, as Virilio writes, "the war of milieu is succeeded by war waged on the milieu—nature, society."[42] This suicidal ethos is captured historically by Hitler's Telegram 71, written at the end of the war, in which he declared, "If the war is lost, may the nation perish."[43] The concept of the suicidal state was condensed by Deleuze and Guattari into the following statement: "In fascism the State is far less totalitarian than it is suicidal."[44] On March 19, 1945, Hitler issued the "Demolitions on Reich Territory Decree," or the "Nero Decree," in which he ordered the destruction of German infrastructure so the advancing Allied armies would have nothing to claim. His order was ignored, but arguably this historical antecedent of state suicidalism presages the contemporary capitalist desire to expand industrial infrastructure in the context of mass extinction; in other words, just as in the face of defeat Hitler embraced a nihilism that would doom millions to starvation and death if his order had been executed, the contemporary capitalist push for more accumulation and industrial

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expansion in the context of an existing ecological collapse is choosing self-annihilation over life. Recently, scholars such as Eugene Holland and Nicholas Michelsen have debated whether the definition of the suicidal state offered by Virilio and approved by Deleuze and Guattari is historically accurate or even true to the Deleuzoguattarian understanding of fascism. Holland believes the "problem with Virilio's notion of the suicide state is that it depends on taking Hitler's infamous Telegram 71 . . . and reading it backwards as the interpretive key to the fascist movement and regime as a whole."[45] For Holland, "there is nothing intrinsically 'suicidal' about historical fascism,"[46] and on this point he is correct. On Holland's fundamental critique of Virilio and other theorists of the suicidal state, Michelsen agrees: "The idea that Nazism was suicidal 'from the very beginning' certainly seems problematic," he writes. This projection also "risks inflecting [Deleuze and Guattari's] theory of fascism with an essentialist tone."[47] However, Michelsen argues that Holland's critique ignores a key element in Deleuze and Guattari's definition of fascism, the third, *suicidal* line of flight, in addition to the molar and molecular lines of the political real.[48] Therefore, "to reduce, as Holland does, the third fascist line in Deleuze and Guattari's schema to a contingency of Nazism is to miss a crucial dimension of their political cartography of fascism as entailing *both* reterritorializations and deterritorializations."[49] So, while Holland argues that Virilio's definition of the suicidal state incorrectly reads Hitler's eventual suicidalism as an inherent feature of Nazism, Michelsen accuses Holland of not being Deleuzoguattarian enough. In his March 17, 1976 lecture, Michel Foucault also references Hitler's Telegram 71, this time as the fulfillment of an argument about the Nazi state, racism, and biopower. "There was, in Nazism," writes Foucault, "a coincidence between a generalized biopower and a dictatorship that was at once absolute and retransmitted throughout the entire social body by this fantastic extension of the right to kill and of exposure to death. We have an absolutely racist State, an absolutely murderous State, and an absolutely suicidal State."[50] Foucault argues that the "mechanism inscribed in the workings of the modern State" always leads to suicide. He does not argue for the kind of historicism preferred by Holland; instead, he claims that suicidalism is "inscribed in the workings of all States." A basic omission in these theories of the suicidal state is a concern for the specific technosocial apparatus that produces suicidalism even in the perceived absence of conventional fascism.[51] The normal functioning

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of global capitalism within earth's sixth mass extinction is suicidal, and infrastructure propels this necropolitical capacity.

In the contemporary context of ecological collapse, industrial infrastructure are undeniably essential elements in environmental disintegration. Virilio famously describes "the war machine as the archetype of the industrial machine,"[52] and the German bunkers are "the place where the long organization of territorial infrastructures comes to an end, from the steps of the empire, to the borders of the state, to the continental threshold."[53] Decades after *Bunker Archeology*, Virilio characterized a "new bunker" in his discussion of the Israel-Gaza barrier:

> *The bunker as passage*. You have the humanitarian corridor and the concrete corridor. . . . Bunkers used to be places of shelter, or places from where they could fire on allied ships along the Atlantic coast; now they've become corridors of concrete. The new bunker is a passage from one place to another. It makes you think of "gated communities" in the United States . . . not mentioning Latin America, the Alphavilles in Sao Paolo, etc. There are even some starting up in France.[54]

From architecture to infrastructure, the bunker takes on a transitive quality, with securitized state borders and capitalist "free trade zones," corridor urbanism and the Calais Jungle, forming a global sarcophagus. New intercontinental fixed-link megastructures will extend "territorial infrastructures" beyond "the continental threshold," as we enter an era of fixed-link planetary infrastructure including proposals for a global highway, a rail tunnel under the Strait of Gibraltar to connect Africa and Europe, and various bridges or tunnels to connect Asia and North America over the Bering Sea. The purpose of these and many other intercontinental fixed-link infrastructure projects is to embed the escalation of primitive accumulation in increasingly global and permanent megastructures, a systemic intensification of hyperindustrialism that will ensure the path to human extinction is paved and resilient.

While scientists continue to debate the onset of the Anthropocene, some date its beginning to 1950 and the postwar Great Acceleration that included the radioactive fallout from testing nuclear bombs, as well as the transformation of the planet by the distribution of "plastic pollution, aluminium and concrete particles, and high levels of nitrogen and phosphate in soils, derived from artificial fertilisers."[55] The terrestrial resources extracted for human use tripled between 1970 and 2010.[56] The rapidity with which these signals of a new geological era have embedded, sometimes

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irreversibly, in the earth is unprecedented, and most of these signals can be traced directly to the expansion of industrial capitalism, which included an unprecedented urbanization project. In the past 20 years alone, for example, global construction has consumed more than half of the concrete ever produced.[57] The more than 50 billion tonnes of concrete that have been produced are enough to pour a kilogram of concrete on every square meter of the planet.[58] So much concrete is being produced today that there is actually a global shortage of sand, creating violent gang warfare in places such as India over the $2.3 billion annual trade, and escalating ecological crises emerging from legal and illegal sand mining.[59] Ironically, the ubiquity of concrete might be one reason for the relative absence of its aesthetic consideration beyond notable architectural movements such as brutalism; a definitive exception to this absence is the work of Adrian Forty, who was determined in his 2012 book *Concrete and Culture* "to think about concrete in all the diversity of its applications, not just those controlled by architects and engineers, but to deal with its presence everywhere, whether in the work of self-builders, sculptors, writers, politicians, entrepreneurs, photographers or film-makers."[60] Forty, a professor of architectural history, did a masterful job of finding many of the cultural manifestations of concrete. In many ways, my book expands on his foundational work. Forty's emphasis on architectural history tends to overlook the infrastructural narratives that I study, but his work articulates important ideas that make possible the study of infrastructure and culture. Forty describes the fundamental association of concrete and modernity, and our attendant "discomfort" with both.[61] "At least in the West, as long as concrete remains bound to modernity, with all the tensions that carries in its train, concrete cannot easily revert to invisibility," writes Forty.[62] Concrete is often figured as "a dumb or stupid material, more associated with death than life," and no doubt this cultural framing of concrete has contributed to the postindustrial fantasies of "frictionless," "smart," "green" capitalism.[63] There is also a class-based distaste for concrete, which is used by the poor for construction to such an extent that Forty says it "probably exceeds all other applications."[64] Even within the building trades, concrete is considered the provenance of lower-status labor.[65] Historically, concrete construction enables what Forty calls "a satisfactory separation of the mental from the manual elements of labour," and this has led to its use in projects involving forced labor; most of the canals and highways built under Stalin, to offer one somewhat modern

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example, were constructed using labor from the gulags.[66] Not surprisingly, then, concrete became a prominent fixture in utopian movements and socialist politics, beginning with Sir Thomas More's *Utopia* (1516).[67] From the early twentieth century onward, concrete was often aligned with leftist politics: "the synthetic nature of reinforced concrete made it a symbol for Lenin's view of the 'indissoluble unity' of the proletariat, formed through the process of revolution."[68] Soviet dominance in Eastern Europe became synonymous with the prefabricated concrete slabs of *Plattenbau* apartment buildings.[69] Forty points to the standardized composition of these buildings and their rapid construction as a contemporary potential for dramatic social changes as they simultaneously decay:

> The millions of dwellings built in the 40-year period between 1950 and 1990 with broadly similar systems will all deteriorate over a similar period, some of them sooner rather than later. For many East European and Asian states, these buildings are a burden beyond their means and, because of the nature of their construction, beyond the means of those who live in them. In 2000 one World Health Organization official foresaw that the condition of the buildings could threaten political stability in those regions. Far from being an agent of social unity, concrete may yet provoke a revolution.[70]

The current era sees therefore both massive postwar concrete buildings and infrastructures falling into disrepair and unprecedented proposals for new construction. A unique opportunity exists to abate the capitalist misuse and excessive deployment of concrete, to redirect the affective ties to concrete, and to prevent a fatalistic sensibility from becoming entrenched due to the depressing combination of ecological and urban conditions. The revolutionary potential of concrete is no longer attached singularly to proletarian productivity and utopian aspirations; on the contrary, much of the revolutionary potential of concrete now resides in its decay and destruction, in the assemblages of rapid industrial deceleration. The embrace of industrial modernization by both capitalist and communist nations in the twentieth century contributed to the current consumption of materials used in concrete production, which accounts for about 8 billion tonnes of raw materials annually; only water outpaces concrete as the most used material on the planet.[71] Cement production accounts for 5 to 10 percent of global CO_2 emissions.[72] Waste produced by construction and demolition constitutes approximately 25 to 50 percent of annual municipal solid waste in Europe.[73] All major capitalist economies plan to escalate concrete

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production in the coming decades, and infrastructure represents a key component of this escalation. The first major infrastructure project to utilize concrete extensively was the Pont-sur-Yonne Aqueduct, completed in 1873 and designed by French industrialist and Saint-Simonian socialist François Coignet.[74] Almost 150 years later, in the context of an unprecedented capitalist investment in infrastructure construction, there can no longer be a radical vision of the future that relies so excessively on concrete to produce wealth for redistribution. The depletion of resources and the catastrophic destruction of global ecosystems will not allow it.

Industrial Collapse and Infrastructural Brutalism

As part of its postwar reconstruction effort, in 1945 France sent a team of experts to study the New Deal construction projects in the United States, especially the planned development of the Tennessee Valley Authority (TVA), with the goal of visiting infrastructure such as highways, dams, and airports, and documenting the lessons applicable to the war-ravaged landscape across the Atlantic.[75] The team was particularly impressed with TVA dams. Michel Écochard, an architect and member of the French team, enthusiastically declared at the completion of the mission: "The beauty of the dams and their infrastructure . . . satisfied me both aesthetically and practically."[76] In 1946, following the team that crisscrossed the United States, the Swiss-French architect and urban planner Le Corbusier visited the Norris Dam, constructed by the TVA on the Clinch River in Anderson County and Campbell County, Tennessee.[77] Le Corbusier was impressed by the poured-concrete modernist appearance of the dam, which was designed by the Hungarian-American socialist Roland Wank, and Le Corbusier's own work of the 1930s "had already begun to focus on the union of architecture and infrastructure, drawn in part from his admiration for the American elevated highway."[78] Le Corbusier was similarly impressed with the Pentagon, which he visited on his way back to New York from Tennessee. Its scale and use of concrete contained elements over which Le Corbusier marveled as "all that [I] could design in [my] projects so implacably rejected until now."[79] From 1947 to 1952, Le Corbusier would reproduce the aesthetic of the Norris Dam in one of his most famous projects, the Unité d'Habitation in Marseilles. While the invention of the modernist architectural style that became known as *béton brut*, or raw concrete, has a more

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varied set of origins, this specific connection between architectural brutalism and the aesthetic of infrastructural megastructures provides a nexus from which to elaborate what I am calling infrastructural brutalism, an aesthetic and broad political program that emerges in the spaces of industrial infrastructure expansion and collapse, in particular as the global ecological collapse confronts the paradoxical and suicidal continuing expansion of industrial capitalism. Architectural brutalism emerges, in the British context in particular, as a by-product of petromodernity. Barnabas Calder calls the brutalist period in British architecture "an orgiastic celebration" of the emergent "massive energy wealth" provided by oil in the 1960s, an inexpensive energy source that provided an abundance of concrete and steel.[80] This exemplary form of modernist architecture is often identified with postwar reconstruction and the rise of the welfare state. But infrastructural brutalism has received far less attention, despite its more pervasive presence. Consider the collective aesthetic and political materializations of over 19.5 million kilometers of paved roads worldwide,[81] more than 4.3 million kilometers of pipelines carrying oil, gas, water, condensate, and refined products,[82] and more than 1.3 million kilometers of railway networks.[83] Consider the International Energy Agency's prediction that for the projected increases in global capitalist trade, "the world will need to add nearly 25 million paved road lane-kilometres and 335,000 rail track kilometres, or a 60 percent increase over 2010 combined road and rail network length by 2050."[84] Over 95 percent of the human population now breathes heavily polluted air, with people in the Global South at far greater risk than others; over 6 million people died from air pollution in 2016.[85] The existing and projected industrial infrastructure carpets the overdeveloped world, but to date there are few comprehensive attempts to articulate the intersection of what Brian Larkin calls "the politics and poetics of infrastructure"[86] in terms of the necropolitics of infrastructure.

Infrastructural brutalism is an aesthetic, a political program, and a psychological and material condition. The central paradox of infrastructural brutalism is this: industrial capitalism incurred the sixth mass extinction event in the history of the planet;[87] overfished the oceans and acidified them, similar to the phenomenon that killed off 90 percent of ocean life 252 million years ago;[88] assaulted coral reefs to the extent that 40 percent are in decline worldwide;[89] cut down almost half of the trees (and cuts down another 15 billion every year);[90] killed half of the wild animals on earth in

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the past 40 years;[91] cultivated every space on the planet to the point that there is no longer such a thing as "pristine" land untouched by humans;[92] ignited catastrophic runaway global climate change that, unchecked, will produce an estimated warming of 6° Celsius above baseline by the end of this century;[93] produced 250 billion tonnes of chemical substances annually, leading scientists to declare the earth a "toxic" planet saturated with 144,000 human-made chemicals;[94] produced 8.3 billion tonnes of plastic since the 1950s, and could produce an estimated accumulation of 34 billion tonnes by 2050;[95] and pushed the planet into a new geological epoch termed the Anthropocene, to denote the impact of human beings as the equivalent of a geological force.[96] The scientific evidence that describes this condition is overwhelming; and yet, despite the obvious state of global ecological collapse that is clearly under way, substantial numbers of industrial capitalist societies are actually escalating the urbanization project, building engineering megastructures at an accelerated rate, instead of slowing or reversing the pace of industrialization. With human extinction on the horizon, capitalists have accelerated the construction of the infrastructure that enables ecological devastation at an unprecedented pace. According to a Princeton University study, to avoid catastrophic climate change and keep global warming below 2° C above baseline, the world would have to have stopped building new fossil fuel infrastructure by 2018;[97] a climate study from the UK determined that the world must reach zero carbon emissions many years in advance of 2040, to avoid the Intergovernmental Panel on Climate Change's target of global warming no more than 2° C above baseline.[98] A major report from the IPCC in 2018 warned that the world had 12 years to act, to prevent global warming from increasing more than 1.5° above baseline. The difference between 1.5° and 2° of warming is substantial.[99] Harvard professor of atmospheric chemistry James Anderson has argued that humanity must stop using fossil fuels before 2023 to avoid its own extinction.[100] But in 2015, the world consumed more oil and gas than at any time in human history[101] and recently surpassed an atmospheric carbon dioxide level of 410 ppm, a concentration on track to create a climate not seen in 50 million years.[102] The global consumption of oil is now close to 100 million barrels per day. The consumption of coal has receded recently but still remains well above nineteenth-century rates of consumption; in fact, it is estimated that coal will remain the second-most consumed source of energy until 2030, with an average annual increase in

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consumption of 0.6 percent from 2012 to 2040.[103] As Simon Pirani notes, global consumption of coal in the twentieth century "declined *relatively* [relative to other fossil fuels] while rising in *absolute* terms."[104] In 2017, new coal-fired power plants in India and China contributed to the first increase in coal production in 4 years.[105] In recent years, G20 countries have tripled their subsidies for coal power.[106] And climate change might not be our biggest threat. For example, a massive UN-supported study published in 2018 revealed that biodiversity loss could pose as great a threat to human survival as climate change. The study found that "exploitable fisheries in the world's most populous region—the Asia-Pacific—are on course to decline to zero by 2048; that freshwater availability in the Americas has halved since the 1950s and that 42% of land species in Europe have declined in the past decade."[107] Plant extinction worldwide is happening at 500 times the natural rate of extinction, a serious threat to life on earth because of the oxygen and food plants provide.[108] Concomitant with a global industrial capitalist system that has not slowed its voracious pace of destruction, climate feedback loops appear to be accelerating the ecological collapse; methane, a greenhouse gas that traps heat at approximately 30 times the rate of carbon dioxide, is being released from melting permafrost in the Arctic, which could create a catastrophic positive feedback loop.[109]

Despite the comprehensive scientific consensus on these issues, expanding carbon-intensive infrastructure continues to be a priority for global capitalism. Several countries are building new mega-airports: the Al Maktoum International Airport in Dubai will cost $32 billion and carry an estimated 160 million passengers every year; the Beijing Daxing International Airport is expected to cost $11 billion and handle 120 to 200 million passengers annually; Hamad International Airport in Doha expects to service 92 million passengers annually.[110] The Panama Canal, now over a century old, recently completed a $5.25 billion expansion of its locks to accommodate new container ships known as neo-Panamax, which can carry twice as many containers as the old ships. Panama also spent billions on new metro lines, a massive new bridge over the canal to connect car traffic and trains, and doubled the size of its existing airport.[111] In 2019, ground broke in Peru on construction of a new multibillion-dollar airport close to the citadel of Machu Picchu, which would ensure a greater rush of tourists to an already overburdened heritage site. Increased air traffic worldwide is accompanied by increased ocean commerce. In early 2016, the *Benjamin Franklin*, the

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largest container ship ever to dock in the United States, arrived in the port of Los Angeles, which had been modified to accommodate the vessel.[112] A 2009 study determined that just 15 of the largest container ships at the time created as much pollution as 760 million cars, and pollution from the 90,000 cargo ships in circulation at the time led to 60,000 premature human deaths every year.[113] Infrastructural brutalism is therefore not only a historical legacy of modern state capitalism but a continuing production. Over the next 20 years it will either be reversed in aggregate, in what might be termed a Great Deceleration, or will be a central feature of mass, and eventually human, extinction.

Global Infrastructure Expansion, China's "Belt and Road Initiative," and the Ecological Collapse

Reviewing Vaclav Smil's 2013 book *Making the Modern World*, Bill Gates foregrounds a fact that obviously amazed him as much as it did Smil: from 2011 to 2013, China used more cement than the United States had in the entire twentieth century.[114] The symbolism in Gates's attention to cement is fairly straightforward: the man whose company contributed central material and ideological components to the neoliberal era of capitalism, and who published popular texts that spread the neoliberal mythology of a smooth-functioning digitalized capitalism that would lift millions out of poverty and solve all of the ecological catastrophes capitalism itself created, was writing about a material often set in the public imaginary at an opposite pole from the postindustrial fantasy of the frictionless knowledge economy. While Gates's purpose in writing was to signal more applications of software, in attempting to make cement "smart" and celebrating Smil's apparent pragmatism and optimism he instead foregrounded an uncomfortable reality. Almost 40 years after the start of the home computing revolution, the most important material of industrial capitalism remains concrete, the world has not become paperless, less consumptive, more leisurely, or in any sense "more environmentally friendly," and the future of so-called postindustrial capitalism signals a dramatic increase in the application of traditionally industrial materials. According to the 2012 OECD study *Strategic Transport Infrastructure Needs to 2030*, global transport infrastructure investment needs from 2010 to 2030 will cost over $11 trillion.[115] The OECD estimates a doubling of global GDP over that period,

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which includes a doubling of air passenger traffic, a tripling of air freight, and a quadrupling of maritime container traffic.[116] The *Economist* called this explosion of spending on conventional infrastructure "the biggest investment boom in history,"[117] with much of it concentrated in the BRIC countries and almost half of that spending occurring in China. From 2003 to 2008, China spent more in real terms on infrastructure than it had for the entire twentieth century. China annually consumes 40 percent of the world's cement and steel,[118] and its construction boom extends to a variety of infrastructural escalations:

> By 2020 forty Chinese cities will have subway systems, totalling 7,000 km of track—over five times the total of the USA. In 2005, China had 41,000 km of highway; in just nine years this had multiplied by two and a half times and is now the most extensive network in the world. Prior to 2003 China had no high-speed rail lines in operation; it now has a system that totals 12,000 km, the most extensive in the world, which is expected to grow to 50,000 km by 2020—enough to stretch around the world one and a quarter times. On top of this, 82 new civil airports are being built and 101 current airports are being expanded. This includes a US$14 billion behemoth in the south of Beijing that will be the size of Bermuda and will require 116,000 people to be relocated. By the end of 2015, 80 per cent of the Chinese population will live within 100 km of an airport.[119]

The Amur River rail bridge, set to become the first continuous link between Russia and China, is designed to significantly reduce the cost of transporting Russian iron ore to China.[120] China and Russia also plan to build a $242 billion, 4,350-mile rail link between Beijing and Moscow.[121] China has also expressed the desire to build a rail line through the Himalayas by 2030, connecting Tibet with South Asia.[122] The freight rail line from Yiwu, China to Madrid, Spain is already the longest railway route in the world, and is one of several such lines that connect Chinese cities with European cities.

China's current spending on infrastructure exceeds that of the US and Western Europe combined.[123] An important driver of China's current economic, domestic, and foreign policy is known variously as the New Silk Road, One Belt, One Road, or the Belt and Road Initiative (BRI), a multitrillion-dollar plan to build "railways, ports, roads, dams, pipelines and industrial corridors across dozens of countries in Asia, Europe and Africa," with the aim of boosting China's economy and extending its political and economic influence.[124] Bruno Maçães, a senior fellow at the

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Hudson Institute and former Secretary of State for European Affairs in Portugal, believes the initiative "is by design a project meant to encompass the whole world and the totality of human life. No other organized project or idea can rival it in this respect."[125] China announced the plan in 2013 and has established several economic institutions, including the Asian Infrastructure Investment Bank, to funnel billions in private investments into infrastructure construction annually. China's "infrastructure diplomacy" will extend its political and economic influence in a profound array of technosocial assemblages:

> On the border with Kazakhstan, the small town of Korgos in Xinjiang is being transformed into a distribution hub for Central Asia, with new rail and road links from the regional capital of Urumqi to Almaty, Kazakhstan's biggest city, and on to Iran. Train links to Europe run via Kazakhstan from cities across China. To the south, vast new markets are designed to re-establish Kashgar—one of the busiest bazaars on the old Silk Road—as a regional gateway. Chinese firms have built roads to neighbouring Kyrgyzstan and Tajikistan, and there are plans to lay railway lines through the Karakoram and Pamir mountain ranges to Pakistan, Uzbekistan and beyond. Trade flows and economic activity have yet to match the building frenzy, but no one can doubt the intent.[126]

To make possible some of the Belt and Road connections inside China, the government has reportedly detained as many as one million Uighurs and other Muslim minorities in "reeducation centers" in Xinjiang province in the northwestern region of the country. Xinjiang is a region rich in resources, including an estimated 21 billion tons of oil reserves, the largest coal reserves in China, and massive natural gas discoveries in the Tarim Basin. Many Uighurs have resisted being ruled by the Han Chinese majority that migrated to the region. Some observers describe the Chinese use of detention camps as a form of cultural genocide, in conjunction with various forms of surveillance technology, state checkpoints, torture, and forced indoctrination.

The Belt and Road Initiative incorporates cultural propaganda into its economic and infrastructural trajectories. In April 2018, Renmin University of China, based in Beijing, announced the founding of a graduate school dedicated to producing advocates for the initiative. The program offers majors in Chinese politics, economics, law, and culture. Peking University's Guanghua School of Management announced in April 2018 the launch of a Belt and Road Institute that would educate future business leaders. As of

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June 2018, the Belt and Road University Alliance, a collaboration among universities dedicated to the exchange of ideas in education, science and technology, and culture along the BRI route, had 170 members. In December 2017, Kabul News TV aired an Afghan-Chinese documentary film about the BRI as an opportunity for closer ties between the two countries. In June 2017, China signed film and cultural exchange cooperation memoranda with 13 of the BRI countries; almost half of the films received by the 2017 Shanghai International Film Festival (SIFF) were from BRI countries, and the 2018 edition of the festival featured a week devoted to films from BRI countries, as well as the formation of the Belt and Road Film Festival Alliance, an agreement among 31 film festival organizations from 29 of the BRI countries. The 2018 Belt and Road Week at SIFF featured 154 films from 49 of the BRI countries. The 2017 China International Cartoon Creative Industry Fair also emphasized how its participants were engaging members of the BRI in efforts to share Chinese animation. In addition to Chinese animation, the Belt and Road Cultural Development Action Plan (for the years 2016 to 2020) advocates for cultural exchanges with BRI countries that include the Heilongjiang Acrobatic Troupe, the culture of Keemun black tea, traditional wood carving and painting, and Chinese Song brocades (silk).[127] In March 2019, China Radio International announced a photography competition called "On the Road," which was intended to profile life lived along the routes of the Belt and Road Initiative. That same month the third Belt and Road International Music Festival, which featured more than 800 musicians from 40 countries, was held in Shenzen. The BRI Documentary Consortium was launched in April 2019 as an organized effort to use documentary film to promote the ambitions of the BRI in cooperation with BRI nations. In the summer of 2019, the Penang Asia Comic Cultural Museum in Malaysia displayed 88 illustrations from a comic book titled *Belt and Road Initiative for Win-Winism*, a publication (issued in English and Mandarin) by the museum designed to promote the BRI's relationship with Malaysia.

In May 2017, the Xinhua News Agency, the official press organ of the People's Republic of China, released a bizarre music video to promote the Belt and Road Initiative.[128] Like the US Farm Security Administration's 1937 documentary *The River* (discussed in chapter 1 of this book), "Belt and Road, Sing Along" is government propaganda in service of a massive infrastructure project (though the Chinese undertaking is many times greater in

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scope than that of the Tennessee Valley Authority). Very much unlike *The River*, the "Belt and Road" video combines finger-snapping, line-dancing Chinese youth and the occasional appearance of a person in a panda costume with scenes of freight transport and nuclear power and lyrics that celebrate "mutual benefit, joint responsibility, and shared destiny." As the song alternates between the chorus of "Whoo, Yi Dai Yi Lu, Belt and Road!" and verses that exult the initiative's "extensive consultation, joint contribution, and shared benefits," it becomes abundantly clear how difficult it is to capture youthful enthusiasm in the state celebration of industrial infrastructure. Infrastructure scholars often acknowledge how (intentionally) boring infrastructural objects are (and perhaps need to be), and the "Belt and Road" video illustrates the bracing contradictions between the expansion of international industrial infrastructure and buoyant youthful optimism. Not to be deterred, the New Zealand China Council announced in May 2018 its intent to develop an interactive game about the BRI.

In November 2014 at the Asia-Pacific Economic Cooperation (APEC) forum in Beijing, China formally announced its infrastructure diplomacy to foreign leaders including the US president and Japanese prime minister. In a suitably ironic twist, the gray skies of Beijing were turned blue by a government order to close factories, keep cars off the roads, and shut down schools and businesses.[129] Before officially announcing to important dignitaries the largest infrastructure project in human history, China had to order the closure of its existing infrastructure so that the skies would not resemble the opening scene of *Blade Runner*. The Belt and Road Initiative is expected to "extend from the Pacific to the heart of Europe, stimulate some $4 trillion in investment over the next three decades, and draw in countries that account for 70 percent of the world's energy reserves."[130] Between 2013 and 2018, the BRI accounted for $6 trillion in goods trade volume among BRI countries, and Chinese companies had more than $90 trillion in direct investment in BRI countries.[131] While Western capitalism pushed global ecosystems into the sixth mass extinction, the Belt and Road Initiative, if successful and in combination with infrastructure initiatives around the world, would likely ensure a combination of overconsumption, catastrophic climate change, and ecosystem degradation from which humanity would not be able to recover. Despite the BRI's declared intention to make the largest infrastructure project in history "green," escalating accumulation and consumption on such a scale simply cannot produce sustainable

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results. In addition, as environmental lawyer Jinmei Liu notes, many BRI projects promote oil and gas extraction, and the existing government regulations are nonbinding, which ensures an increase in greenhouse gas emissions and other forms of environmental degradation.[132]

Of course, long before the BRI the world was hurtling toward ecological catastrophe because of the centuries-long dominance of capitalism. Capitalism is not in the least responsive to the global ecological collapse, nor can it be. Instead, capitalism continues to advance the concrete contours of industrial infrastructure, consuming vital resources, condemning millions to premature deaths, and blocking potential exit routes from its own systemic suicide. The paradox of infrastructural brutalism—what makes it so *brutal*—lies in the response of capitalism to its own suicidal trajectory. Some capitalists have publicly declared their preference for suicide over social transformation: the former CEO of Exxon Mobil, Rex Tillerson, when pressed to establish greenhouse gas emission targets for his company, asked, "What good is it to save the planet if humanity suffers?"[133] At the structural level, capitalism shows no signs of stepping back from the abyss; instead, some capitalists promote "technology transfer," carbon taxes, and other failed market mechanisms as solutions to the crises before us, while most of capitalism remains determined to expand industrial urbanization, encourage myriad forms of overconsumption, and push the epistemological boundaries of the technoscientific death drive. In North America and Europe, the focus of politicians and capitalists has been on the repair and expansion of existing industrial infrastructure, much of it constructed after World War II and now reaching the end of its life cycle. The only distinction between liberal and conservative voices is whether the massive repair and expansion of infrastructure should be paid for by private or public money. Liberal and progressive commentators often discuss the need to invest public money in the repair of infrastructure—in the United States, the American Society of Civil Engineers (ASCE) estimated an investment of $3.6 trillion would be necessary by 2020 to fix the nation's crumbling industrial infrastructure[134]—but the public discussion of industrial infrastructure rarely exhibits the kind of complexity it requires. Some infrastructure should be retrofitted instead of repaired, for example, while other infrastructure should be expertly decommissioned or destroyed, based, at the very least, on the unfolding environmental crises. The dominant political position regarding infrastructure in capitalist countries of the Global

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North is the liberal desire to repair decaying infrastructure for the sake of capitalist markets; environmental concerns are smothered in the rhetoric of *resilience* and *greening the economy*, and mainstream discussions of how infrastructure affects oppressed groups is almost nonexistent. American lawyer Philip K. Howard's remarks in the *Atlantic* are typical of the rush-to-repair mentality:

> Lengthy environmental review is dramatically *harmful* to the environment. Prolonging traffic and rail bottlenecks, the Common Good report found, means that billions of tons of carbon are unnecessarily released as officials, environmentalists, and neighbors bicker over project details. America's archaic power grid—not replaced in part because of permitting uncertainties—wastes electricity equivalent to the output of 200 coal-burning power plants. At this point, the decrepit state of America's infrastructure means that almost any modernization, on balance, will be good for the environment. Water pipes from 100 years ago leak an estimated 2.1 trillion gallons of water per year. Faulty wastewater systems release 850 billion gallons of waste into surface waters every year. Overall, America's infrastructure receives a D+ rating from the American Society of Civil Engineers. For every project that is environmentally controversial, such as the Keystone pipeline, there are scores of projects that would easily provide a net benefit to the environment.[135]

Like the ASCE reports, this type of analysis hurriedly frames the current debate over infrastructure in capitalist and modernist terms of "to repair or not to repair," instead of seeing infrastructure as a complex assemblage of cultures, human actors, laws, economic imperatives, ecological webs, construction materials, and institutional, geographical, and ecological legacies. The problem is the resilience of global capitalism, its ability to incorporate multiple suicidal trajectories into the processes of deterritorialization. To advocate only for repair and expansion, at this critical juncture in the history of infrastructure, is short-sighted and potentially irreversible, an escalation of already-suicidal capitalist assemblages.

Infrastructure Is Visible until It Breaks

One of the most frequently repeated truisms in infrastructure studies is the claim that infrastructure, however defined, remains invisible until it breaks. This claim is derived from a slight misreading of Susan Leigh Star's declaration that infrastructure is "by definition" invisible. To understand Star's statement, it must be placed in the context of her full remarks on the topic:

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> People commonly envision infrastructure as a system of substrates—railroad lines, pipes and plumbing, electrical power plants, and wires. It is by definition invisible, part of the background for other kinds of work. . . . The image becomes more complicated when one begins to investigate large-scale technical systems in the making, or to examine the situations of those who are not served by a particular infrastructure. . . . One person's infrastructure is another's topic, or difficulty.[136]

Later, Star includes the following in her typology of infrastructure: "The normally invisible quality of working infrastructure becomes visible when it breaks: the server is down, the bridge washes out, there is a power blackout."[137] While Star certainly foregrounds the "normally invisible quality of working infrastructure," she also considers the nuances of how such technosocial assemblages become visible or invisible to particular subjectivities; also, obviously, "normally invisible" is not the same as *always* invisible, or invisible "by definition." The reading of her work that is often repeated—to the point of becoming a cliché in the literature—is a reductive representation of Star's position. Equally important, the reductive definition of infrastructure as inherently invisible is demonstrably false, as Brian Larkin argues in his seminal review article:

> Thus many studies that begin by stating how infrastructures are invisible until they break down are fundamentally inaccurate. Infrastructures are metapragmatic objects, signs of themselves deployed in particular circulatory regimes to establish sets of effects. It is commonplace, seemingly obligatory, for almost any study of infrastructure to repeat Star's assertion that infrastructures are "by definition invisible," taken for granted, and that they only become visible on breakdown. But this assertion is a partial truth and, as a way of describing infrastructure as a whole, flatly untenable. Invisibility is certainly one aspect of infrastructure, but it is only one and at the extreme edge of a range of visibilities that move from unseen to grand spectacles and everything in between.[138]

Nikhil Anand echoes the critique of infrastructure as invisible, in his study of Mumbai's water network, by acknowledging that infrastructures are "neither ontologically prior to politics nor are they merely effects of social organization." That is, the alleged invisibility of infrastructure is not only contradicted by phenomenological experiences, it is also made problematic by the processual, relational nature of infrastructure being imagined, described, constructed, and maintained. "Infrastructures are flaky accretions of sociomaterial *processes* that are brought into being through relations *with* human bodies, discourses, and other things (sewage, soil, water, filtration plants)," Anand continues.[139] The visibility of infrastructure is constituted

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in process, by interactions with humans and their discourses, and with nonhuman objects and animals. Anand's work also problematizes the belief held in some quarters that infrastructure visibility in the Global South exposes a homogeneous poverty and breakdown that sits opposite the Global North and its presumably invisible and functioning infrastructure. In recent years, several examples of infrastructure failure in the United States—the I-35W bridge collapse in Minneapolis, Minnesota, contaminated water from neglected pipes in Flint, Michigan, and the near-catastrophic breach of the Oroville Dam spillway in northern California, for example—have "challenged our imagined geographies of breakdown, abandonment, and infrastructural development."[140] Visibility no longer indicates a definitive correlation between regional wealth and operational or dysfunctional infrastructure.[141]

Absent from much of infrastructure studies is a consideration of the substantial visibility of infrastructure in artistic texts, both contemporary and historical. Indeed, most of this book analyzes artistic texts—novels, films, photographs, television shows—that focus primarily on the "range of visibilities" of infrastructure, often in ways that interrogate the hegemonic narratives of capitalism and the state form. Even the infrastructure that is built to be buried—pipes, wires, and the stuff that undergirds cities, for example—becomes visible in ways other than breakdown: for example, from 1805 to 1812, Pierre Bruneseau explored the sewers of Paris, and by the 1867 World Exposition there were public tours available; today, one can visit Les Égouts de Paris (the Sewer Museum of Paris). Or consider the paintings of the prolific eighteenth-century French artist Hubert Robert, such as *Aqueduct in Ruins* or *Bridge over a Cascade*, which depict a neoclassical fascination with the sublimity of Roman ruins and Parisian futurity in apocalyptic destruction. All infrastructure is visible first as infrastructural imaginary, government policy, or corporate planning, then as design, then as massive construction phase, then in operation, then as ruins; artistic interventions depict the full range of engagements with infrastructure, from the formulation of an idea to the often-troubled construction to the historical legacies. The processes of conception and construction are, of course, reciprocal, each informing the other. It is no longer sufficient to repeat the claim that infrastructure is "by definition" invisible, or that it only becomes visible when it breaks; instead, let us consider how infrastructure is always visible *to* and *for* some, and how art in particular can contribute to the subtle or dramatic

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shifts in public perceptions of infrastructure, especially in the context of late capitalism and global ecological collapse. Infrastructure has become so visible, in fact, that the conventional definition no longer accounts for the true scope of what Keller Easterling calls infrastructural space:

> Infrastructure is considered to be a hidden substrate—the binding medium or current between objects of positive consequence, shape, and law. Yet today, more than grids of pipes and wires, infrastructure includes pools of microwaves beaming from satellites and populations of atomized electronic devices that we hold in our hands. The shared standards and ideas that control everything from technical objects to management styles also constitute an infrastructure. Far from hidden, infrastructure is now the overt point of contact and access between us all—the rules governing the space of everyday life.[142]

The "waves and radiation" that American author Don DeLillo made famous as a Buddhist vision of the dead speaking to the living in his 1986 novel *White Noise* has become formalized by cultural observers such as Easterling as the infrastructure of modernity beyond the "pipes and wires," perhaps no longer mysterious because of its enduring banal interface with the everyday. What DeLillo framed as a component of postmodern spiritualism Easterling sees 30 years later as something almost too visible to be mystifying. Infrastructure is visible until it breaks, either because the break disrupts a pattern of semiotic recognition most people understand (capitalist modernity, the myth of progress, and other ideological commitments that make *invisible* the necropolitical valences, ecological collapse, mass extinction, and so on), or because the break is the periodic disruption that makes constitution of the dominant narrative possible.

Nicole Starosielski recommends we see fiber optic infrastructure "as a material system whose visibility must be continually constructed in order to maintain a smooth and effective sphere of global communication."[143] Instead of figuring a universal infrastructure as always already invisible, Starosielski examines what she calls the "the production of 'existing visibilities,' the visual traces of cable infrastructure as it surfaces in public space and material environments, and how this visibility is negotiated in relation to specific local circumstances."[144] Infrastructural visibility must be produced and negotiated through semio-materialist practices, of which the circulation of artistic expressions is a prominent component. Sometimes, as in the example of some cable infrastructure, infrastructure is made (in)visible in specific ways to perpetuate the operationality of the infrastructure.[145]

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Starosielski complicates the continuum of "unseen to grand spectacle," proposed by Larkin, and the invisibility produced by banal, repetitive operation, astutely described by Geoffrey Bowker, Star, and others.[146] The simple binary of visible and invisible gives way in the work of Starosielski and others to a multiplicity of possibilities. While occasionally recognized as a "mode of infrastructural visibility,"[147] art is often ignored in the literature of infrastructure studies when considering the primary objects and ideas that constitute a particular mode.

As a vital component of infrastructural visibility, art (or culture, if you like) participates in both of what Harvey, Jensen, and Morita call "engineered (i.e. planned and purposefully crafted) or non-engineered (i.e. unplanned and emergent) activities."[148] The engineered activities often include government propaganda, and nonengineered activities include the emergent art forms that circulate within the context of infrastructure propagation, reflect and inform its construction, and sometimes become the ideological basis for resisting its creation. Harvey, Jensen, and Morita call this circulation "a recursive movement in which forms of infrastructure generate effects that loop back upon society, organizations, and people, *re*-shaping them in turn."[149] The provocative possibility for intentional sociotechnical transformation might not always exist in the apparently anomalous breakdowns of infrastructure, but instead "with gaps, interstices, and zones of opacity as infrastructural facts, which raise questions concerning the kinds of ordering these apparent 'flow-stoppers' participate in and how they do so."[150] Indeed, the opacity or indeterminacy of an infrastructural assemblage might exist in the affective coordination of maintenance, the dark money that generates reactionary politics, or the insurgent desire of revolutionary actions. Artistic media such as films, photography, and literature can capture, interrogate, and circulate the transversal properties of infrastructural indeterminacy more effectively than engineering studies, government propaganda, or capitalist entrepreneurship.

Artistic Narratives and Infrastructure

Prominent scholars in infrastructure studies have identified the importance of culture in infrastructural assemblages, but the field has not devoted much serious consideration to the question of how culture is or has been

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important. Starosielski, whose excellent work on cable infrastructures was discussed above, places considerable emphasis on historical and cultural matrices that traverse the geographic and engineering lines of flight in cable infrastructure. In *The Undersea Network*, she articulates four types of stories that commonly frame cable infrastructure in her ethnographic research: connection, disruption, nodal, and transmission narratives, the latter two of which move beyond simple discourses of cable connection or repair.[151] By situating cable infrastructures in the discursive environment of popular culture and therefore beyond the instance of their construction, nodal and transmission narratives "extend the spatial and temporal parameters for cable discourse, suggest new lines of causality in global network development, and set the groundwork for further engagement with operational cable systems." By doing so, "these narratives short-circuit the ideological power conducted by narratives of connection and disruption."[152] Attention to infrastructural narratives can be as powerful as, or more powerful than, the materials used in construction, potentially disrupting hegemonic cultural legacies and contributing to new practices. Architect Keller Easterling figures hegemonic stories as "ingrained expectations" that "have the power to buckle concrete and bend steel, and they can often be difficult to escape."[153] Ned Rossiter, discussing the interplay of modern software logistics and infrastructure and the ways in which they coproduce the infrastructural spaces of Easterling's "extrastatecraft," believes a confrontation with such neoliberal spaces must possess "an alternative logistical fiction that imagines a repurposing of the infrastructures that make us who we are."[154] The scale of software logistics and infrastructure requires "a scaling of our political imagination to grasp the distribution both of technology and the human."[155] The "logistical nightmare" of Rossiter's proposed confrontation with the infrastructural future understands the centrality of culture to its ambitions: "What we now need to do is devise a grammar of connection between different types of spatial imagination and forge new territories toward a politics of operation."[156]

Cultural narratives are not simply abstractions borne of infrastructural capacity, the playthings of a mind given time to think because the grid is operational. These narratives have provided state capitalism with an almost unchecked ability to dig, pour, nail, drill, and paint its way to mass extinctions. But infrastructural narratives will also be part of any resistance to

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this suicidal trajectory. Stephanie LeMenager, in her brilliant book *Living Oil: Petroleum Culture in the American Century*, argues that "the narrative arts will be key actors in establishing the ecological resilience of the human species."[157] Historian Christopher F. Jones believes infrastructural narratives are an essential component of energy regime transformation, based on his study of the emergence of oil in the northeastern United States:

> A common assumption is that we can simply replace coal-fired power plants with wind turbines and expect everything else to remain the same. History suggests otherwise. To plan more effective and equitable energy transitions, we need to incorporate a broader range of perspectives. In addition to discussing technological developments and economic costs, we must consider society and culture; humanists, social scientists, and citizens should be at the table alongside technical experts.[158]

Alberto Toscano and Jeff Kinkle look to art in their mapping of contemporary capitalism. This is not a frivolous exercise, they argue, but an attempt to find pivots or weaknesses in global capitalism, from which revolutionary politics can articulate strategic movements. "What is at stake is the figurability or representability of our present and its shaping effect on political action," they argue. "In a strong interpretation, the mapping of capitalism is a precondition for identifying any 'levers,' nerve-centres, or weak links in the political anatomy of contemporary domination."[159] My book follows this trajectory, not in a singular pursuit of weaknesses in contemporary capitalism but instead toward theoretical multiplicities that interrogate academic disciplinary assumptions, find generative homologies between infrastructural and narrative forms, and offer radical transit in the transversal escape routes from systemic suicide. The general purpose of examining art and infrastructure in this book is to critique their hegemonic relationship; the purpose of critique, in this context, is, to use Deleuze's definition, "not justification but a different way of feeling: another sensibility."[160] A sensibility informed by the myth of progress and unrelenting capitalist exploitation created the current conditions. There is now little time to change that sensibility. While some of the art under consideration reifies hegemonic discourses of settler capitalism, and therefore serves as examples of oppressive infrastructural discourses, some of the works explored in this book act as "points of departure to change the world," in Santiago Zabala's words, "a world that needs new interpretations instead of better descriptions."[161]

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The Relational Technicity of Infrastructure and the Anarchist Tradition

Only a revolutionary examination of existing infrastructure, retrofitting of carbon-intensive infrastructure, decommissioning of untenable infrastructure that requires expert knowledge, and sabotaging of the infrastructure that is too dangerous to keep is capable of transforming conditions currently so brutal that they incur mass extinction. These forms of deterritorialization and reterritorialization must be part of resistance to infrastructural brutalism. No single tactic of resistance can achieve the massive transformation necessary in the next 20 years. The relational epistemology embraced by this book emerged from the radical struggles of nineteenth-century European socialism, in ways that closely resemble contemporary assemblage theory. The following discussion therefore frames the methodological premises of the book in the context of the anarchist tradition, to demonstrate the historical commingling of revolutionary politics, assemblage theory, and infrastructural brutalism.[162] Concomitant with the revolutions of the nineteenth century, workers were transforming Europe with infrastructural megaprojects, especially in the Haussmannization of Paris, and radical thinkers were publishing treatises on technology and its relational properties. Kristin Ross reminds us that a substantial number of the Communards who occupied Paris for 71 days in 1871 "were the semiskilled day laborers (*journaliers*) who had migrated from the provinces to work on Haussmann's massive and fantastic urban-renewal projects."[163] By 1870, the Haussmannization of Paris had cost 2.5 billion francs and involved one-fifth of the workers in Paris.[164] Therefore, infrastructure played an important but often overlooked role in one of the most important European revolutions of the modern period. Around the same time, Italian refugees and workers traveled to Egypt to build the Suez Canal and develop anarcho-syndicalist currents within the diverse Egyptian labor movement. Following this migration to Egypt, in the early twentieth century anarchists in Egypt promoted an internationalist agenda that countered the oppressions of capitalism, imperialism, and nationalism.[165] Egypt became part of an international network of anarcho-syndicalism. The renovation of Paris and the construction of the Suez Canal are two examples of infrastructure and revolutionary politics converging, and certainly there is more work to be done in recovering additional histories of this kind. It is also worth noting the substantial loss of life suffered by working communities in the construction of infrastructure,

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something often neglected in the study of infrastructure: for example, over 30,000 workers died in the construction of the Panama Canal; 12,000 to 16,000 forced laborers died in the construction of the Burma Railway, representations of which are discussed in chapter 4 of this book; and the Aswan Dam in Egypt, the subject of Anne Michaels's novel *The Winter Vault*, cost 500 workers their lives. In terms of revolutionary history, infrastructure has put tremendous burdens on working people while escalating the dispossession of Indigenous people and the rate of primitive accumulation. Relative to the centralization of wealth and power over the past 150 years, industrial infrastructure has not improved the lives of the oppressed.

While Karl Marx is often cited as the earliest modern socialist to address the centrality of technology to industrial societies, it was in fact Proudhon who "supplie[d] the impetus for Marx's turn to the study of machines and, more broadly, to science and technology as a terrain in which political and economic questions were increasingly salient."[166] In *The Philosophy of Poverty*, Proudhon declares that "what the economists ought to say is that machinery, like the division of labour, in the present system of social economy is at once a source of wealth and a permanent and fatal cause of misery."[167] Machines increase production volume (albeit at the expense of quality) and, by replacing workers, reduce wage expenses and enable the capitalist to sell cheaper on the market. But at the same time the workers' buying power is reduced and the economy enters a crisis of overproduction. "Thus machinery, after crushing the workmen, is not slow in dealing employers a counter-blow; for, if production excludes consumption, it is soon obliged to stop itself," Proudhon writes.[168]

Marx criticized Proudhon's idealization of artisans' biases, which ended up glorifying the mechanized independent workshop as a site at which "the antinomy of the division of labor, if not entirely destroyed, will be balanced and neutralized."[169] Yet Marx concurred that "by the introduction of machinery, the division of labour inside society has grown up, the task of the worker inside the workshop has been simplified, capital has been concentrated, human beings have been further dismembered."[170] Marx would have much more to say about capitalist accumulation, but it is evident that both he and Proudhon were coming to a similar understanding of the basic dynamic of overproduction in 1846–1847. Furthermore, Proudhon's core account of the machine does not depend on his broader idealism and may even be read as pointing past humanism. Stood on its feet, the same

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account emerges more recently in STS discussions. Consider Proudhon's definition of the machine:

> What is a machine, in fact? A method of reuniting diverse particles of labor which division had separated. Every machine may be defined as a summary of several operations, a simplification of powers, a condensation of labor . . . an abridgment of manual labor which multiplies the power of the producer.[171]

Ethically, Proudhon links the machine to an account of liberty that identifies its positive sense with power, and he frames the machine as a liberating force. Proudhon celebrates the machine for its potency, linking it to an account of positive liberty as power. Liberty is "that power which man acquires of using his forces more easily in proportion as he frees himself from the obstacles which originally hindered the exercise thereof."[172] Negative liberty, freedom from obstacles, is here auxiliary to empowerment. On this reading, power/freedom becomes self-reinforcing even as obstacles to its exercise cease to constrain it. The combination of functions in the machine is an increase in power, and therefore a purveyor of positive liberty. Thus, "man, in inventing a machine, serves his liberty . . . because he determines it [, not just] because he removes a difficulty from its path."[173]

Ontologically, however, Proudhon views the machine not as "merely a productive force" but as a locus in a lattice of forces instantiated by both human and machine agency. Hence his warning against communist proposals for state-managed production:

> Machines do not go all alone: to keep them in motion it is necessary to organize an immense service around them; so that in the end, man creating for himself an amount of work proportional to the number of instruments with which he surrounds himself, the principal consideration in the matter of machinery is much less to divide its products than to see that it is fed.[174]

Here Proudhon most closely anticipates modern concerns with "the construction of a technical system that involves human beings as operating parts" and the "reconstruction of social roles and relationships."[175] His account of machinery's demands is effectively elaborated by referring to what contemporary STS scholars would call a sociotechnical assemblage. In Proudhon's account, new machinery does not only make some workers redundant; it also brings about new configurations of bodies, machines, and their reciprocal agencies. This is a major theme in contemporary STS writings that deploy the Deleuzian concept of assemblage. Although it has

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more radical ontological implications than Proudhon's idealism could contain, his emphasis on the relationality of machinery places him on the same horizon of meaning with modern discussions of sociotechnical assemblage. Deleuze and Guattari treat assemblages as generic, diagrammatic configurations in and on which forces operate, an abstract but constitutive field relation of "lines of articulation or segmentarity, strata and territories; but also lines of flight, movements of deterritorialization and destratification. Comparative rates of flow on these lines produce phenomena of relative slowness and viscosity, or, on contrary, of acceleration and rupture. All this, lines and measurable speeds, constitutes an *assemblage*."[176]

Deleuze and Guattari discuss assemblage and machines in literary terms to approach a generic ontology, but this ontology has been taken up by STS scholars to discuss sociotechnical assemblages from energy infrastructures to ubiquitous surveillance and digital media. This literature draws on the various "new materialisms" that emphasize distributed agency, an "unstable cascade" of intentionalities and "the conjoined effect of a variety of kinds of bodies."[177] Assemblage theory makes room for "a general, non-anthropomorphic affectivity within dynamic systems,"[178] in which power is distributed among humans, nonhuman actors, and objects. It thus transcends enlightenment humanism and its constructions of agency and subjectivity.

Marx, too, approaches assemblage thinking in his later work. David Harvey, contradicting the popular interpretation of Marx as a technological determinist, describes Marx's analysis as bringing together "mental conceptions, social relations and technologies" in a totality which is not Hegelian but "more like an ecological totality, what Lefebvre refers to as an 'ensemble' or Deleuze as an 'assemblage,' of moments of coevolving in an open, dialectical manner."[179] In his later work, Marx would also come to embrace the ontological role of technology, wherein the labor process was seen as "no longer a singularly or uniquely human process."[180] As Arthur Bradley explains:

> If Marx starts out from the neo-Aristotelian position that human species-being makes and uses tools in order to fulfill preconceived ends—this is the species difference between human labour, on the one hand, and the labour of bees or spiders, on the other—he ends up arguing that the tool, in turn, generates new ends—new needs, new instincts, new ideas—that did not pre-exist its use: "the satisfaction of the first need, *the action of satisfying, and the instrument of satisfaction which has been required*, leads to new needs."[181]

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Bradley argues that what remain for a "Marxian philosophy of technology" to determine, once some kind of human-technology reciprocity is assumed, "are not the false dualisms of humanism or technocentrism, agency or determinism, cause or effect, and so on but rather what we have called the mutually constituting 'between' of the human-tool relation."[182] For Bradley, this makes Marx the "original thinker of originary technicity,"[183] the notion that no human essence precedes the interaction with technology, or what Bradley describes as "less a tool or prosthesis that has been super-added *to* life nor even quite a metaphor *for* life but what I will call the empirico-transcendental condition *of* life itself."[184] This idea that technology—tools, techne, technicity—co-constitutes us from the beginning is prevalent in contemporary studies of technology; typically, however, it is accompanied by a more strident antihumanism than Marx or Proudhon would have accepted.

The ambivalence toward technology prefigured in early socialist works remained present in anarchist discourse throughout the nineteenth century. Thus while Carlo Pisacane, an Italian follower of Proudhon, was "convinced that railroads, electrical telegraphs, machinery, industrial advances, in short, everything that expands and smoothes the way for trade, is destined inevitably to impoverish the masses,"[185] his countryman Carlo Cafiero called for the "introduction on an immense scale of machines of all kinds" to serve workers, produce a surfeit of necessities, and dispel the notion that socialism was impractical.[186] Similarly, even though Bakunin praised science for positing "true abstractions which express the general nature and logic of things" and thus foresaw its becoming "society's collective consciousness," he also warned against its "claim to the governance of societies," with the social engineering implicit in Comte and Marx.[187] Peter Kropotkin, however, most often expressed an optimistic belief in the revolutionary potential of technology, and promoted industrialization through a "general education" in "science and handicraft alike."[188] In *Fields, Factories and Workshops*, he celebrates the coevolution of agriculture and industrial manufacturing: "Agriculture calls manufacturers into existence, and manufactures support agricultures. Both are inseparable; and the combination, the integration of both things brings about the grandest results."[189] He calls for "more technical education," which will be "a boon for humanity."[190] Kropotkin was by no means celebrating hard labor, of course; in his discussion of the "Paris gardener," Kropotkin describes "our ambition" to

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"produce even more" than the Paris gardener with "less labour," and to "enjoy all the joys of human life."[191] But his understanding of scientific "progress" is deeply problematic, tinged with the belief that "the resources of science" are "inexhaustible."[192] Kropotkin avowed: "Whenever a saving of human labour can be obtained by means of a machine, the machine is welcome and will be resorted to; and there is hardly one single branch of industry into which machinery work could not be introduced with great advantage, at least at some stages of the manufacture."[193]

As George Woodcock rightly observes, "Kropotkin's was essentially—and perhaps rather surprisingly—an anthropocentric vision of a developing world."[194] What Woodcock describes as "the sharp limitations" of Kropotkin's outlook emerge from modern environmentalists' benefit of hindsight, as the twentieth century witnessed the catastrophic results of peaking resource use and sinks. While today most people cannot completely and immediately sever themselves from vast infrastructural assemblages, once aware of the destructive processes involved, their affective relationship with these assemblages becomes at best a sense of unease and at worst an almost suicidal anxiety. Thus, when Murray Bookchin, almost a century after Kropotkin, advocates the embrace of technology to "reawaken man's sense of dependence upon the environment" by freeing human beings from menial labor, his techno-optimism seems somewhat outdated.[195]

The mid-twentieth century, however, saw many anarchists adopt analyses of technology written by nonanarchist authors including Lewis Mumford, Ivan Illich, and E. F. Schumacher and address technologies such as the atom bomb, birth control, and television, which had qualitatively different scales and capacities for destruction and liberation. As a result, we see a distinct shift in priorities, from the nineteenth-century celebration of the productive (and therefore liberatory) capacities of certain industrial technology (matched, of course, with decentralized forms of governance) to the twentieth-century call for "a break with systems of so-called 'high technology'" and an ecocentric celebration of small, convivial, intermediate technologies. John Clark provides a succinct list of characteristics for these more "appropriate" technological complexes:

> low consumption of resources; utilization of widely dispersed, renewable energy sources; minimal disturbance of ecosystems; human scale; comprehensibility; compatibility with aesthetic values; feasibility of continual reassessment and fundamental redesign in relation to analysis of needs; multifunctionality; capacity to

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> fulfill basic human needs; tendency to reduce artificial scarcities; incompatibility with technocratic and bureaucratic structures; compatibility with democratic control of society, decentralized decision-making, and nonhierarchical social structures; conduciveness to production processes involving enjoyment, creativity, and human development.[196]

This list of desiderata is laudable by most measures. Yet a contemporary anarchist politics of technology must consider technological reconstruction without neglecting the legacies of past technologies (the *longue durée* of sociotechnical materiality). The material tendencies of our petromodern era ensure that whatever the future holds, it cannot be like the past; there is no linear descent from the peak curve into pristine conditions, no parlor trick to make centuries of ruinous structures evaporate without a trace, no time machine capable of reversing the Columbian exchange, no space on earth that is exclusive of nuclear contamination, global warming, or the toxic drift of industrial living. Hence, even as we build technosocial assemblages appropriate for life beyond capitalism, we cannot project their proliferation in society as a blueprint onto a blank canvas. Any anarchist politics of technology must contend with a world that is *always already toxic* and in various stages of collapse. A more generative anarchist approach to technology might therefore emphasize experimentation with new conjunctions of humans and nonhuman actors. To ask how both literal and abstract machines connect flows of desire and produce habit-forming potentials takes the matter beyond an ethically bounded techno-optimism to a plane where analyzing *actual relationalities* in the sociotechnical assemblage can aid reconstruction, desertion, and sabotage.

Instead of seeing urban spaces, for example, as atomized blocks of petromodern ruins, we could use the concept of assemblage to understand "the spatially processual, relational and generative nature of the city, where 'generative' refers both to the momentum of historical processes and political economies and to the eventful, disruptive, atmospheric, and random juxtapositions that characterize urban space."[197] Thus, the city becomes "a place that is not just inhabited but which is produced through that inhabiting," a constitution of urban space that Colin McFarlane calls "dwelling."[198] Urban space in the context of collapse, especially, is invested with fluid potentialities, such as urban gardening, scavenging or squatting, radical orientations to the city that do not privilege assigned neoliberal purposes but rather destabilize those purposes through new forms of "cofunctioning."[199]

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Assemblage theory applied to an anarchist politics of infrastructure suggests, therefore, a more radical ontology than lists of static features of technologies appropriate for a liberated society. It "implies a greater conceptual openness to the unexpected outcomes of disparate intentions and activities,"[200] juxtaposed with expectations of unproblematic social reconstruction with "appropriate" technologies. In particular, assemblage thinking emphasizes "the depth and potentiality of sites and actors in terms of their histories, the labour required to produce them, and their inevitable capacity to exceed the sum of their connections."[201] This "depth," especially in terms of the legacies of technological systems, will be particularly important in the age of collapse, because it offers a better understanding of the materialities and capacities of systems that break down, and opens up possibilities of reuse, salvage, and reconstitution which will become all-important under rapidly deteriorating conditions.

Infrastructural Brutalism: Art and the Necropolitics of Infrastructure

The chapters of this book are arranged according to artistic genres that engage infrastructural poetics: "drowned town" fiction, the road movie, energy landscape photography, and death train narratives in film and literature. The first chapter examines the literature of the United States and Canada for "drowned town" fictions, stories about the arrival of hydroelectric projects during and after the establishment of the Tennessee Valley Authority. Drowned town fiction frequently performs what Mark Rifkin calls "settler common sense," a nonnative quotidian gesture that naturalizes "settler jurisdiction" and other modes of occupation without treating the dispossession of Indigenous people. In such stories, white settler nostalgia for a mythical landscape before the flooding, or for a mythical agrarian culture, overrides the structural violence that accompanies large dam construction.

Chapter 2 considers road movies in terms of protocological control, Alexander Galloway's term for the ways in which technicity under liberal governmentality restricts freedom. Film studies has largely ignored the material properties of the road in its examination of the road movie genre. A subgenre of the road movie, the existential road movie, foregrounds the road as a fatalistic inevitability, but in doing so often erases "transportation racism," the racist violence of highway construction. The postapocalyptic

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road movie envisions the end of liberal governmentality and speculates about the possibilities for life and death in the absence of the state form. This chapter concludes with literary representations of the road that are told from nonhuman perspectives, a point of view the road movie genre has yet to engage.

Chapter 3 examines the agency and ruination of oil capitalism through the lens of energy landscape photography. The media of oil capitalism often obscure the pervasive destruction of this economic system, from resource wars and toxic human bodies to the mechanized slaughter of nonhuman animals and the abandoned infrastructure of orphaned oil wells. The artistic media considered in this chapter consider the processes of ruination in the context of durable infrastructure assemblages that produce a sense of ideological continuity and structural benevolence. The chapter explores the photography of Warren Cariou, Edward Burtynsky, and Mitch Epstein, as well as other media such as the television show *True Detective*, in an effort to define possible futures under the material duress of oil capitalism and its remains.

Chapter 4 assesses the necropolitics of the death train narrative, stories in which the construction or use of a railroad results in mass death. Colonial empires exploited railways for mechanized, rapid forms of primitive accumulation, a practice that continues today. From the Ugandan "Lunatic Express" to the mid-twentieth-century atrocities of the Burma Railway and the Nazi Holocaust, ending with fictional postapocalyptic death train narratives in *Snowpiercer* and *Train to Busan*, this chapter foregrounds the necropolitical valences of state and capitalist logistics. From the early 3D film *Bwana Devil* to the cinematic classic *The Bridge on the River Kwai*, the recent Man Booker Prize-winning novel *The Narrow Road to the Deep North*, and the popular postapocalyptic films mentioned above, a wide range of death train narratives capture the genocidal infrastructural violence of the railway and its impact on potential forms of liberatory politics.

The conclusion outlines the need for what I am calling *brisantic politics*, a culture of unmaking capable of slowing the advance of capitalist suicide. Brisance refers to the shattering effect of an explosive, but in this instance encompasses a wide range of practices dedicated to defeating infrastructural power from an antiauthoritarian perspective. The capacity to slow industrial capitalism's ecological devastation and human subjugation requires a reorientation of radical politics toward infrastructure, sabotage, and the

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unpredictability of cascading destruction in an intensely interconnected world. Indigenous resistance to the Dakota Access Pipeline (#NoDAPL), the Italian No TAV (Treno ad Alta Velocità) movement, and the struggle of the Indigenous Munduruku nation against the São Manoel hydroelectric dam in the Brazilian Amazon all represent revolutionary attempts to disrupt or destroy important infrastructural assemblages. The "shattering effect" of brisantic politics need not be in the form of actual explosives; rather, this form of radical response to infrastructural brutalism embodies ideas, materialities, and assemblages whose trajectory extends in the direction of unbuilding the most egregious examples of necropolitical capitalist infrastructure, by interrupting, retrofitting, sabotaging, or destroying the infrastructure in question. The future will be brutal, but we can engage in the project of making it less so.

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1 Drowned Town Fiction: The Intimate Poetics of Large Dams and Settler Common Sense

> Later he remembered what the explorer Johann Burckhardt had said to him—"We have so long forgotten how to be intimate with immensity."
>
> —Anne Michaels, *The Winter Vault*

> If the water, a relative, is not protected, then the river is not free, and neither are its people.
>
> —Nick Estes

One of the most poetic meditations on the relationship between hydrology and ontology is *El botón de nácar* (*The Pearl Button*), a 2015 documentary by Chilean director Patricio Guzmán. Guzmán traces water from the cosmological to the political, impressionistically from Chile's prehistoric past to its recent brutal history under the dictatorship of Pinochet. "There's water in the planets," he intones near the beginning of this journey. Water is the narrative thread that connects the cosmos to western Chile and its mountainous edges that dissolve into thousands of islands, where, until the arrival of English colonists in the nineteenth century, Indigenous "water nomads" roamed from island to island. When Captain Robert FitzRoy arrived in Patagonia following his travels with Charles Darwin on the HMS *Beagle*, he abducted one of the Indigenous locals, named him Jeremy Button, and took him to England where he would be dressed as an Englishman and taught to speak English. Button would later return to Patagonia, speaking half in English and half in the Yaghan language, but Guzmán understatedly observes that he "was never the same man again." Patagonia would never be the same, either. Guzmán connects the story of Jeremy Button to the discovery at the bottom of the ocean of a button fixed to a

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piece of rail used to bind, torture, and kill one of the thousands of Chile's disappeared from the Pinochet era. This button was the only remnant of a person executed by fascists and disposed of in the ocean. Pearl buttons, coincidentally, were once a thriving industry in the Tennessee Valley, the river basin that informs much of this chapter.[1] "Both buttons tell the same story, a story of extermination," explains Guzmán. These periods of extermination, for Guzmán, are indicative of a kind of hydropolitical proximity: Chileans, despite their 4,200 kilometers of coastline, have lost "intimacy with the sea," he declares. English colonialism violently displaced the Indigenous people of Patagonia, embodied in the story of Jeremy Button, and Pinochet later violently crushed the Allende revolution, which, says Guzmán, "began to give back to the natives." The trajectory of Chilean history drifts away from its Indigenous roots and the ocean with which it is geographically juxtaposed. *The Pearl Button* brilliantly captures the flow of power through water, from Indigenous cosmology to colonial dispossession and fascist state apparatus.

Today, in the age of infrastructural brutalism when thousands of large dams thwart the tendencies of rivers in order to drive the machinery of industrial capitalism worldwide, hydrological connectedness draws our attention to "the interconnectivity of power, the way sources of energy are converted into one another: from hydrokinetic to direct-current to alternating-current to thermodynamic; or between cultural, economic, historical, and material forms of power."[2] The sense of interconnectedness illustrated in *The Pearl Button* evokes Timothy Morton's notion of "the ecological thought," an epistemological sense of belonging that is at once melancholic, tragic, and inescapable.[3] The epistemology on display also resembles Deleuze and Guattari's claim that "every politics is simultaneously a *macropolitics* and a *micropolitics*,"[4] and this chapter explores the continuum from micro to macro as depicted in *drowned town fiction*, a literary subgenre that portrays the deliberate flooding of towns and landscapes for the construction of hydroelectric assemblages. Water infrastructure illustrates more explicitly than most infrastructure "the barely perceived transitions in power that occur in and through situated encounters";[5] as dams, canals, and hydroelectric apparatuses attempt to capture hydrological cycles in service of industrial applications, flows of water become flows of electricity and transversally transit an incomprehensible complexity of human and nonhuman interactions. Large dams are visible in specific

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ways that are easier to measure and make discernible in terms of the macropolitical, but often their sequential relations with the micropolitical are obscured. As Ara Wilson notes in her astute reading of infrastructure and intimacy, "Understanding how infrastructures enable or hinder intimacy is a conduit to understanding the concrete force of abstract fields of power [such as colonialism, homophobia, and gender binaries] by allowing us to identify actually existing systems rather than a priori structures."[6] Infrastructure such as large dams at first glance seems too distant and immense to be appropriate for discussions of intimacy, often because these objects' codification by state and capitalist entities presents them as distinct demarcations in the public/private binary. But Wilson correctly conjoins the studies of infrastructure and intimacy, based on the "unbounded meaning" of the respective terms[7] and the "complex, nonreductive understandings of materiality" in both infrastructure studies and affect studies.[8] The "object pluralism"[9] promoted in studies of intimacy and studies of infrastructure enables analyses of infrastructural assemblages to trace "circuits of power, norms, and agency that are realized in particular modes of relations."[10] Wilson illustrates the ways in which the "tearoom trade" of sexual encounters among gay men in public restrooms both incorporated and refuted the cultural, psychic, and infrastructural impositions of sex-segregated bathrooms, a "queer use of the bathrooms" that "was not built into their design but reflected a repurposing of structures that exist not as timeless features of the landscape but as a result of a history that includes ideology and psychic investments in gender as well as racial and economic politics and even geopolitics."[11] The hydropolitical possibilities embodied in public restrooms, which must trace their material potential to dams, canals, sewers, and other hydrological features of the modern urban landscape, emerged in the United States dramatically as a result of New Deal policies and the Works Progress Administration, but the primary intentions and gendered and racial commitments of the state were radically complicated by queer intimacies. One of the questions that subtends this chapter, then, attempts to conjoin historical and contemporary hydro megaprojects with the varied affective and micropolitical engagements that accompany the construction of large dams and the flooding of populated spaces: In what ways does drowned town fiction produce counternarratives to the hegemonic myth of progress, and how might these narratives be mobilized as interventions against infrastructural brutalism?

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The literature examined in this chapter does not only counter the cliché that infrastructure is invisible until it breaks; by telling stories of how people anticipated or tried to prevent the arrival of hydroelectricity, for example, it also illustrates the myriad constellations of visibility that comprise "an intersecting set of processes, practices, and meanings that cuts across disciplinary boundaries."[12] Large dams transform landscapes in aesthetically, ecologically, and politically meaningful ways for audiences to their construction, while also providing "perhaps the most versatile reservoir of symbolic meaning that can be accessed by political power."[13] Finally, large dam assemblages are notable for their temporality: as Christopher Sneddon describes this phenomenon, "large dams generate and hold together assemblages of geopolitical and technological networks—among others—that *linger*."[14] Literature provides an ideal discourse for the encounter with these lingering networks of parastatal organizations, capitalist industries, symbolic registers, and river basin ecologies, precisely because literature need not respond to contemporary political or economic demands; literature can reveal overlapping temporalities, imaginative discourses, and material impacts, from micropolitical to macropolitical, that would otherwise be invisible to nearsighted political entities, profit-driven capitalist industries, or racist colonial violence.

Hydropolitics

Most discussions of hydropolitics begin with Karl Wittfogel's classic but now disputed 1957 *Oriental Despotism: A Comparative Study of Total Power*.[15] Wittfogel, a playwright, historian, and lapsed communist who spent nine months in a Nazi concentration camp in 1933, argued that irrigation infrastructure produced centralized political authority that resulted in what he called the "hydraulic society." Of the many aspects of his thesis that have been contested since its publication, most critics see the apparent determinism of the connection between large irrigation systems and authoritarian governance to be extremely problematic. Wittfogel contends that water infrastructure becomes "institutionally decisive" in the hydraulic society:

> If irrigation farming depends on the effective handling of water, the distinctive quality of water—its tendency to gather in bulk—becomes institutionally decisive. A large quantity of water can be channelled and kept within bounds only

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> by the use of mass labor: and this mass labor must be coordinated, disciplined and led.[16]

The resulting governance required by large irrigation infrastructure is necessarily authoritarian, argues Wittfogel: political leadership follows from environmental transformation and infrastructural demands.[17] The chain of determinism extends from the "biophysical properties" of water to the "institutional consequences" of infrastructural governance.[18] While Wittfogel's argument involves more complexity than this brief summary can provide, it should be noted that subsequent research illustrates that the relationship between irrigation infrastructure and governance need not be authoritarian.[19] Another major problem with Wittfogel's thesis, in terms of the current study, is that "infrastructure is the least explicitly conceptualized category in *Oriental Despotism*," despite infrastructure being the foundation on which he constructs a theory of political economy.[20] Interestingly, Wittfogel's functional definition of infrastructure included an aesthetic dimension.[21] He considered "hydraulic works" such as canals, aqueducts, and reservoirs to be "usually less impressive" aesthetically than certain "nonhydraulic works" such as palaces, tombs, and temples of the hydraulic society.[22] While the "contrast" is not absolute—some "irrigation works" and "highways" do "achieve considerable functional beauty"[23]—those who dominate the society prefer to invest more in the constructions that celebrate the ruling order. Wittfogel described the "architectual style" of hydraulic societies as "monumental,"[24] and cited everything from the Forbidden City to the pyramids of ancient Egypt as evidence. Perhaps Wittfogel's generalizations, imperfect though they may be, offer a partial explanation for why infrastructure, large dams in particular, has sometimes been overlooked by artists and academics. Until recently, most societies have not cultivated an appreciation for the occasional aesthetic beauty of infrastructure, nor have academics devoted much space to the intimate contours of infrastructure examined in this chapter; instead, the modern state has gradually cultivated a nationalist symbolic in which water resources and infrastructure become icons of national identity and little else.[25] On the contrary, of course, much of the infrastructure that binds the industrial world and erases natural environments contributes to aesthetic and psychological blight. A substantial element of the current project is to assess the aesthetics of infrastructure—in this chapter, large dam construction—and map the

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intersections of aesthetic representations with historical and necropolitical tendencies culminating with infrastructural brutalism.

The problematic quality of Wittfogel's thoroughly critiqued hydraulic society is amplified by the theory's endorsement from Deleuze and Guattari in *Anti-Oedipus* and *A Thousand Plateaus*. Deleuze and Guattari reference Wittfogel as part of their theory of state capture and territorialization:

> [I]t is certain that the state itself needs a hydraulic science. . . . But it needs it in a very different form, because the State needs to subordinate hydraulic force to conduits, pipes, embankments, which prevent turbulence, which constrain movement to go from one point to another, and space itself to be striated and measured, which makes the fluid depend on the solid, and flows proceed by parallel, laminar layers.[26]

Large dams exemplify the striated space of state territorialization, but there is no causal link between a large dam and authoritarian governance. Clearly, however, the global rush toward modernization—which, for the building of large dams, peaked between 1930 and 1970, but has recently witnessed a resurgence—contributed substantially to a global order of state capitalism that has engendered ecological collapse in the form of the Great Acceleration. The hydraulic thesis of Wittfogel, with its causal link between water infrastructure, environment, and governance, should not be completely discarded because of its flaws; instead, critiques of Wittfogel generate valuable questions about the relationships between water and authority, infrastructure and governance, questions that will become more crucial in the coming decades as the world confronts multiple water crises related to climate change and hyperindustrialism. For example, John Protevi believes Wittfogel's hydraulic society can be part of a "hydro-bio-politics," despite the flawed theory of Oriental despotism.[27] The state form and capitalism are primary structural forces in the production of mass extinction, desertification, and climate weirdness, and the continuing control of flows—of water and oil—into hyperindustrialism will only accelerate the suicidal trajectory of global capitalism and prevent regional forms of autonomy from emerging. One of the most important concerns for the study of infrastructure in the coming decades, then, is to understand better how large water infrastructure prohibits dramatic social change, accelerates ecological catastrophe, and channels the flows of regional water resources into flows of global capitalism, which is incapable of reversing or slowing the ecological collapse.

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Large Dams

From 40 to 80 million people have been displaced by large dam construction worldwide.[28] Of those displaced, a "large majority" have been impoverished by the process.[29] The flaws of large dams are now commonly understood:

> Benefits are overstated and costs understated. Especially serious are the adverse environmental impacts on the world's river basins, impacts that tend to be irreversible where dams are built on mainstreams and large tributaries. Implementation continues to impoverish the majority of those who must be resettled from reservoir basins and project works, and to adversely affect millions of people who live below dams and whose living standards are dependent on natural food regimes.[30]

The crushing poverty and cultural defacement produced by large dams, and their consistent failure to live up to the cost and benefit projections of the states and capitalists who profit from them, also distributes misery downstream from the concrete edifice by negatively affecting "the livelihoods of roughly another 500 million people" and converting "tens of thousands of riverine environments into highly regulated water systems at a scale unprecedented in the history of the planet."[31] Worldwide there are over 57,000 large dams (dams at least 15 meters in height), at a construction cost of over $2 trillion, and according to Christopher Sneddon a "second phase" of large dam proliferation has arrived.[32] Large dams are associated not only with ecological devastation and cultural genocide; they are also famous for economic corruption. Perhaps the most famous theft of public money under the cover of an engineering megastructure happened during the construction of the Yacyretá Dam. Conceived during the military dictatorships in Argentina and Paraguay and budgeted at $2.5 billion, the dam eventually cost $10 billion and was the nexus of political and capitalist corruption.[33]

The most prominent regions for the expansion of large dam construction today are South Asia, China, and South America. In the tropical river basins of the Amazon, Congo and Mekong alone, 450 dams have been proposed, 334 of those in the Amazon, and collectively these dams could endanger up to one-third of all freshwater fish in the world, according to ecologists.[34] China not only erected the historic Three Gorges Dam, an unprecedented hydrological megastructure now "plagued by reports of floating archipelagoes of garbage, carpets of algae and landslides on the banks along the

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vast expanse of still water";[35] it has also been actively financing hundreds of dam projects in 70 countries.[36] Three Gorges Dam, initially conceived in 1919, was celebrated in Mao's 1956 poem "Swimming": Mao writes of "swimming across the great Yangtze," and how someday "Walls of stone will stand upstream to the west / To hold back Wushan's clouds and rain." A "mountain goddess . . . / Will marvel at a world so changed," he concludes, providing a powerful cultural myth to perpetuate the dream of a megastructure whose construction would not begin until 18 years after his death. While Three Gorges Dam produces an estimated eight times as much power as the Hoover Dam on the Colorado River, and its construction displaced 1.2 million people, it will not be the largest hydrological megastructure for long. China has exported its expertise to the Inga 3 Project in the Democratic Republic of Congo, the first phase of a project that could cost $100 billion, displace 60,000 people, and produce twice as much power as Three Gorges Dam.[37] Even as some experts are declaring the era of large dams over and the need to decommission many large dams an urgent matter, large dam construction continues to expand its technosocial reach.

The Tennessee Valley Authority

The global legacy of large dams owes a considerable debt to the Tennessee Valley Authority (TVA), the organizational model for later "river basin governance and regional economic development"[38] around the world. In its May 1933 charter, the TVA was tasked primarily with improving navigation, flood control, and electricity generation in the Tennessee Valley. Between 1933 and 1960, the US government spent $20 billion on dams and other facets of electrical generation being constructed by the TVA.[39] In a process that would largely be repeated in other countries, the poor were most adversely affected by TVA displacements.[40] In the southern United States, and then across North America, the displacement of people for the construction of large dams "affected a disproportionate number of Native Americans."[41] For example, the Pick-Sloan Missouri Basin Plan, created by the Flood Control Act of 1944, was described by the late Sioux historian Vine Deloria, Jr. as "the single most destructive act ever perpetrated on any tribe by the United States."[42] After a decade of social planning and engineering on a massive scale, the TVA produced large dam assemblages that were imitated by nations from around the globe:

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> By 1943 more than 39 million people from almost every country in the world had visited the dams of the TVA. Brazil visited the Tennessee Valley in 1945 and subsequently modeled the Sao Francisco river project after the TVA, beginning construction in 1955. China closely modeled the Yangtze River Project after the TVA, although major construction did not begin until the 1970s. Several other projects were also modeled in some way after the TVA including the Damodar Valley Authority in India, the Mekong River Commission in Asia, and the Snowy Mountain Authority in Australia.[43]

One of the great ironies of the TVA's success is that its primary visionary and chief architect, Roland Wank, was a Hungarian expatriate and socialist who envisioned the TVA as a "social revolution" that would engineer "a nationwide 'army' to produce all kinds of goods, offer better wages, and abolish profiteering."[44] Wank wanted the government to produce prefabricated houses for workers, and he imagined the TVA sponsoring cooperative businesses.[45] Instead, as a consequence of the TVA's success in proliferating itself as a model of river basin management and economic dispossession, global large dam construction projects contributed to a world of accelerated primitive accumulation and capitalist urbanization,[46] and in the American South the TVA was arguably "not the engine of growth that it was previously believed to be."[47] The TVA was also a central node in the development of atomic weapons, with the Oak Ridge location of the Manhattan Project powered by TVA electricity.[48] Internationally, the TVA was an important component of US foreign policy, as Christopher Sneddon convincingly argues. River basin management became part of US efforts to influence industrializing economies,[49] and large dams, "as technological objects constituted through assemblages of capital, knowledge, and power[,] represent a crucial spatial and temporal node of technopolitics in the twentieth century."[50] Simultaneous with US interventionism and the solidification of a global technosocial assemblage that "lingers," to use Sneddon's term, large dam construction also had a tendency to "ignore" local knowledge in favor of parastatal organizational expertise.[51] The legacy of the TVA thus includes its role in global urbanization, capitalist dispossession, geopolitical intervention, the emergence of atomic weapons, the suppression of local knowledges, and a lackluster economic record in the southern United States.

The TVA was not only a major example of social planning in the Roosevelt presidency and an organizational model for global river basin management; it was also a discursive project for government propagandists and

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artists alike. The visual culture produced by TVA construction defined the New Deal era and extended far beyond the architecture of large dams to include "interior, exhibition, environmental, and graphic design."[52] The scale and variety of visual culture that emerged with the TVA demonstrated the aesthetic and political heterogeneity of impervious surfaces, which exhibited propaganda functions in both fascist and socialist states:

> Similar design languages were used at the same time to promote totalitarian regimes in Germany, Italy, and the Soviet Union. . . . The Nazis, Fascists, and Soviets also emphasized public-works projects, with very similar architectural and graphic styles. The graphic iconography, whether modernistic in the Italian mode or neoclassical in the Nazi manner, employs techniques and tropes that can be found in the WPA [Works Progress Administration], like the use of the airbrush to give futuristic luster. Even the TVA logo—a powerful clenched fist holding a lightning bolt—the red, white, and blue patriotic palette notwithstanding—is evocative of numerous totalitarian national, military, paramilitary, and political symbols. And the murals, a hallmark of the WPA's pubic art initiatives, were often rendered in either an overt or stylized heroic realism, not unlike the more turgid versions of Nazi and Socialist realism in Germany and the Soviet Union, respectively.[53]

The dams constructed by the TVA attracted notable intellectuals such as Jean-Paul Sartre, who visited the TVA headquarters and the Norris Dam in 1945 and wrote in *Le Figaro* about the temporary housing.[54] Elements of hydroelectric production, such as the hydraulic turbine generator, inspired artists such as Charles Sheeler, whose 1939 painting *Suspended Power* portrays a turbine being lowered into place by TVA workers at a dam in Guntersville, Alabama.[55] Across the Atlantic, Jean-Luc Godard produced his first film in 1955, *Opération béton* (Operation Concrete), while working on the Grande Dixence Dam in Switzerland, which remains the highest gravity dam in the world. The film is formally unremarkable, but it provided Godard with funds for future projects. While the short film celebrates the construction industry, it also suggests themes that would resonate in future Godard films: "labor, capital, nationalism, the machine-like systems that surround humanity."[56]

Produced by the Farm Security Administration, the short 1937 documentary film *The River* remains one of the most poetic pieces of infrastructure propaganda ever made; simultaneously, as a work of state propaganda, its commitment to macropolitical homogeneity in the form of nationalism effaces the significant micropolitical antagonisms that defined the

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emergence of the TVA and its racialized, gendered, and classist order. The film was named Best Documentary at the 1938 Venice International Film Festival, and its companion book was nominated for the Pulitzer Prize in Poetry. Writer and director Pare Lorentz, a former film critic who had created the 1936 short documentary *The Plow That Broke the Plains* to illustrate the conditions that led to the Dust Bowl, became famous as "FDR's filmmaker" for his work during the New Deal era. *The River* uses images of real working people in everyday forms of labor, moving bales of cotton or plowing fields or invisibly operating a blast furnace. Suturing the images of the laboring classes is the flow of water in a cascade of repetition echoed by the narration:

> From as far West as Idaho,
> Down from the glacier peaks of the Rockies—
> From as far East as New York,
> Down from the turkey ridges of the Alleghenies
> Down from Minnesota, twenty-five hundred miles,
> Carrying every drop of water that flows down two-thirds the continent,
> Carrying every brook and rill, rivulet and creek,
> Carrying all the rivers that run down two-thirds the continent,
> The Mississippi runs to the Gulf of Mexico.[57]

The River repeatedly invokes the nationalist "we" to tell the history of the Mississippi River, strategically omitting racial, gendered, and classist divisions in this story of "men and mules, mules and mud." Lorentz exults: "We fought a war / We fought a war and kept the west bank of the river free of slavery forever. / But we left the old South impoverished and stricken." While the images of *The River* cannot avoid the racist violence of slavery, the text of the film proclaims simply, "And we made cotton king!" Despite Lorentz's Griersonian commitment to depicting the laboring classes in contexts rarely seen in popular films, his text cannot resolve the obvious paradoxes of a country built by capitalist labor: the nationalist impulse to address a homogeneous mass of patriots, which erases the strident inequalities of capitalist oppression. The transformation of the land by industrialized labor is portrayed as a collective effort and achievement:

> We built new machinery and cleared new land in the West.
> Ten million bales down to the Gulf—
> Cotton for the spools of England and France.
> Fifteen million bales down to the Gulf—

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Cotton for the spools of Italy and Germany.
We built a hundred cities and a thousand towns. . . .
We built a new continent.

Ironically, *The River* was blocked from being distributed by Hollywood studios—a piece of government propaganda without a pedestrian form of dissemination—and Lorentz was forced to take the film on the road.[58] The public received *The River* with enthusiasm. Long after the TVA had transformed much of the South, popular films such as Elia Kazan's *Wild River* (1960) continued to portray the TVA's legacy as a progressive achievement of "not only flood control but also electricity, roads, equal pay for black and white workers, and a sense of hope in a better future."[59] Most of the literary treatments of the TVA in the middle of the century were also generally approving of New Deal politics, often framed by a form of white settler agrarian nostalgia.[60]

Large Dams and Literary Types

At two critical junctures in the history of large dam construction, literary authors provided very public interventions: Edward Abbey's public advocacy for rewilding the United States by destroying large dams, culminating in his classic 1975 novel *The Monkey Wrench Gang*, which inspired the creation of the radical environmentalist group Earth First!; and Arundhati Roy's activist work against the Sardar Sarovar Dam in India, which culminated in the 1999 essay collection *The Cost of Living*. Abbey's novel arrived at the end of the period of accelerated large dam construction in the Global North, while Roy's polemic engaged the "concrete revolution" dominating the Global South in the second half of the twentieth century. I will return to Abbey's novel in the conclusion of this book, for a discussion of the anxiety of destruction, but here I would like to consider the commentary of Roy. Roy describes her transformation from literary author to public intellectual, from reading the works of Joyce, Nabokov, and DeLillo "to reports on drainage and irrigation, with journals and books and documentary films about dams and why they're built and what they do."[61] This seemingly innocuous rhetorical gesture—a member of the literati setting aside high modernist and postmodernist literature for technoscientific discourses—reproduces a popular perception of literature: it is abstract, elitist, removed from contemporary concerns and the technical literacy that shapes them. In this

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chapter, I wish to problematize that false dichotomy. Literature has much to say about infrastructure, about large dams in particular, and can be deployed in struggles against hyperindustrialism.

To interrogate the polysemic discourse of literary hydropolitics, I examine the literary genre popularly known as drowned town fiction. This genre typically refers to "fiction with a featured element of intentional submerging, inundating, and flooding of towns, villages, cities, and other places as a consequence of building dams and reservoirs for water supply, hydroelectric power, irrigation, flood management, and job creation."[62] This popular definition addresses formal elements of narratives based on hydropolitical assemblages but obscures the ideological components of a genre that often critiques the myth of progress. Drowned town narratives in literature, theater, and film must be differentiated from global flood myths such as the Babylonian epic of *Gilgamesh*, the Abrahamic story of Noah's ark, or the African Maasai flood myth; drowned town fiction is instead a materialist reflection of sociohistorical conditions, and it is a contemporary of industrial civilization. The flooding of landscapes for the purpose of producing hydroelectric power is one of the infrastructural developments most often identified with the modernist project and the emergence of the industrial state form. Sophia Beal argues that "public works initiatives of the twentieth century . . . introduced a new narrative of national identity" in Brazil,[63] and Michael Rubenstein associates public works such as "water, gas, and electricity" with "the birth of the postcolonial Irish state" in the early twentieth century.[64] While dams have existed for thousands of years, the use of dams for turbine-driven hydroelectric power began in 1878.[65] From the completion of the Hoover Dam in 1935 to the end of the twentieth century, "more than forty-five thousand large dams—dams at least five stories tall—were built in 140 countries."[66] Despite the profound impact these infrastructures produced in the form of environmental devastation, wealth transfer, and displaced people, prominent representations of their construction and preservation are relatively rare, when compared with the frequency with which hydropolitical assemblages materialize. The purpose of foregrounding drowned town fiction, especially in an era of proliferating engineering megastructures, decaying infrastructure, and environmental collapse, is multiple: this genre revisits some of the ideological arguments behind the propagation of large dams; it also foregrounds the imaginative poetics associated with a form of

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infrastructure often portrayed in public discourse simply in terms of its technical functionality.

"There was a time when Big Dams moved men to poetry. Not any longer," writes Roy in her famous polemic.[67] Here, she clearly means a certain kind of poetry, the poetry that celebrates the sublimity of massive infrastructure, such as Mao's poem cited above. Some literary forms have critiqued the myth of progress and others have been invoked as propaganda for authoritarian modernization programs; Sophia Beal reminds us, for example, that the military dictatorship in Brazil (1964–1985) "instituted a national transportation week, organized an anthology of literature related to transportation, and held a competition for the best poem about the Transamazon Highway" while it was being built.[68] Literature need not be narrowly configured as the antiquated pursuit of a hermetic intelligentsia, and infrastructure abounds with aesthetic potential. For Roy, big dams that once moved observers to poetry are now "undemocratic," a "government's way of accumulating authority," a "brazen means of taking water, land, and irrigation away from the poor and gifting it to the rich."[69] Roy writes of new large dam construction as a crisis for Indian democracy.[70] Roy's passage from Man Booker Prize-winning author in 1997 to international advocate for the refugees of large dams by 1999 marks an important moment in the visibility of infrastructure, a progressive advance for the people of the Global South, already locked in battle with colonizing infrastructure projects for decades. Roy's rallying cry toward the end of her polemic should be read as more than just creative speculation; it should be embraced as a call to action. "Who knows, perhaps that's what the twenty-first century has in store for us," she writes. "The dismantling of the big. Big bombs, big dams, big ideologies, big contradictions, big countries, big wars, big heroes, big mistakes. Perhaps it will be the century of the small."[71] Perhaps we need an intimate encounter with these monuments before we can be convinced to dismantle them?

Literary Infrastructuralism

Infrastructuralism is a term being used by some literary critics to describe the "unpredictable and generative responses"[72] in literature to the engineering megastructures that emerged with industrialized societies. While infrastructure is notoriously difficult to define, there is no question that artistic

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forms such as literature participate in the ideological struggles over land use, wealth transfer, environmental degradation, and landscape aesthetics. Over the past decade, literary scholars have been among the most attentive to the contours of infrastructure. Why was the presence of infrastructure in literature ignored by scholars for so long? Perhaps, as Bruce Robbins argues, "infrastructure is the object of no one's desire, or no one but a few passionate amateurs."[73] Infrastructure is an assumption rather than an ambition; to depict it, or to take pleasure in understanding its depictions, returns the artist or critic to the banalities of narratives of progress.[74] But Robbins also situates infrastructure in a dichotomy of public commons and privatized commodities: the seduction of the commodity form does not seem to apply to the public utility, which instead has the "smell of the public" because it is "neglected" as an object of the public domain.[75] This argument risks being analogous with the infrastructure studies cliché about the invisibility of infrastructure until it breaks down; however, Robbins infuses his depiction of public utilities with an ideological commitment. Using the struggles over the privatization of water as his principal example, Robbins contrasts the treatment of utilities under communism, which "wants everything to be public,"[76] with the neglect of utilities under capitalism. Communism "wants us to be conscious of our relation to the sewer."[77] To what end? "Infrastructure needs to be made visible, of course, in order to see how our present landscape is the product of past projects, past struggles, past corruption. . . . But we also need to make infrastructure visible as a guide to the struggles of the present."[78] In a world in which approximately 783 million people do not have access to clean water, and about 2.5 billion people lack basic sanitation,[79] the contemporary struggles over water infrastructure possess an obvious imperative. Understanding the structures of colonial violence and capitalist structural adjustment programs are basic strategies for mapping social relations to the sewers.

Coined recently by a group of literary scholars—Michael Rubenstein, Bruce Robbins, and Sophia Beal—"infrastructuralism" defines a "special attention to modern infrastructures, which are not the easiest things to define."[80] Unfortunately, even this astute group of scholars repeat the familiar refrain that "infrastructure tends to go unnoticed when it's in fine working order."[81] Despite a rich artistic tradition of representing infrastructure and sometimes exalting it, these literary scholars define infrastructuralism in terms of the inherently "boring" quality of infrastructure. They maintain

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that two qualities of infrastructure prohibit human observers from treating it as something worthy of continuing (aesthetic) contemplation: first, as an act of "self-defense" or "active forgetting," humans using infrastructure resist dedicated contemplation of it because to think about it would engender a dizzying distraction that would derail everyday life; and second, infrastructure must remain boring because, as Robbins noted in his essay on the subject, it is part of the public domain and therefore "the object of no one's desire."[82] Infrastructuralism as an ideological project contains admirable objectives. One such is to defend public infrastructure "both from neglect and from privatization."[83] This involves "differentiating between different kinds of infrastructure,"[84] which is often difficult because of the overlap of different forms of governance that typify infrastructural assemblages, something these scholars seem to overlook when they claim infrastructures "are finite forms with boundaries and limits."[85] The most ambitious and simultaneously challenging quality of infrastructuralism as a program is its desire to "be attentive to the difference between the 'planned violence' of infrastructures of control and coercion, often imposed from above in the interests of power, and the infrastructures of provision and entitlement, often demanded from below."[86] While Rubenstein et al. immediately recognize the difficulties that plague attempts to sort infrastructures into groups of good and bad, the parameters of their program seem to be politically progressive.

More than half of the global population lives in cities, and that share is expected to approach 70 percent by 2050.[87] As the global population of slum dwellers approaches 2 billion,[88] representations of urban living have struggled to keep pace with these dramatic changes. In particular, the literature of the city, or what Patricia Yaeger calls "a metropoetics, a set of algorithms for mapping the literature of the city," must contend with the "ruined city," an urban space "that is never repaired."[89] If our "relation to the sewer" can inform contemporary struggles over infrastructure and precarious life in the context of global ecological collapse and continuing capitalist exploitation, then literature can also imagine landscapes of overurbanization, infrastructural decay, and the uneven distribution of infrastructure, food, and shelter. Or, as Yaeger poses the question, "What is it like to be stuck, night and day, dreaming of infrastructure?"[90] What are the semiotics of spaces in which there is no sewer with which to relate? This "poetics of infrastructure" should "describe the flow of literature as it pours

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into and out of the life of cities."[91] Yaeger's "metropoetics" provides an important aesthetic component for understanding infrastructural brutalism, in the sense that it acknowledges how the absence of infrastructure can be a kind of brutality as well. Altogether, these literary scholars encourage a return to infrastructure that warns against neglect, opposes privatization schemes, and exposes the literary examinations of life in urban spaces in disrepair and ruin. While literature certainly provides an artistic medium capable of assessing the transversal properties of infrastructural politics and poetics, which makes literary criticism a valuable contribution to policy discussions,[92] the discourse of literary infrastructuralism should not forget poetics and practices that circumvent or oppose the state form. Policy debates and proponents of public ownership of infrastructure dominate most current forms of infrastructuralism, but the future needs a poetics of resistance based on the abolition of the suicidal state form and its necropolitical infrastructure.

The Drowned Towns of American Literature

Despite the role it played in bringing electricity to the southern United States and then becoming the model organization for other countries embarking on hydroelectric infrastructure projects, the presence of the TVA in American literature during the peak years of TVA construction is surprisingly slight. According to *The Companion to Southern Literature*, "Although [Tennessee Valley Authority] has appeared prominently in a variety of literary forms ranging from poems and songs to novels, a play, and even a movie, the TVA canon remains small."[93] *The Companion to Southern Literature* discusses only two novels from the early years of the TVA: *Mud on the Stars* (1942) and *Dunbar's Cove* (1957). The relative absence of drowned town narratives from the period of the most rapid expansion of hydrological projects might be attributed to two broad tendencies: first, often the communities about which historians and novelists could have written no longer existed; and second, based on historical records of small communities in the American West that were drowned, for example, it appears that "postwar drowned towns rarely opposed dam construction."[94] Many settlers subjected to hydrological developments accepted government payouts for their land, often for reasons framed as patriotism in the contest with the Soviet Union, and some even assisted in the demolition of their

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homes.[95] That is, the absence of literary reflection on the massive project of reshaping hydrological landscapes might in part be a consequence of many settlers not seeing displacement for large dams as an existential crisis equal to what they perceived as the threat of Communism. Recent years have witnessed a resurgence of drowned town narratives, perhaps in response to the excesses of global capitalist development and many infrastructure projects in the Global North reaching the end of their life cycle.

If one looks beyond the period between the 1930s and the 1950s, one finds several entries in this subgenre. The drowned town fiction that depicts the displacement and existential crises of people affected by large hydroelectric dams captures an encounter with infrastructure that was initially framed by the state as the welcome price of modernity, but recently has been incorporated into literature, film, and television as the haunted residue of modernity. These stories are predominantly not activist screeds of socialist realism. The dominant theme in American drowned town literature is that of white settler nostalgia that frequently ignores the populations disproportionately affected by large dam construction, Indigenous communities and African Americans. This chapter foregrounds the micropolitics of large dam construction in American drowned town fiction by framing white settler nostalgia as part of what Mark Rifkin calls "settler common sense," which "seeks to address how the varied legalities, administrative structures, and concrete effects of settler governance get 'renewed' and 'recreated' in ordinary phenomena by nonnative, nonstate actors, in ways that do not necessarily affirm settlement as an explicit, conscious set of imperatives/initiatives or coordinate with each other as a self-identical program."[96] In the case of drowned town fiction, settler nostalgia often erases Indigeneity or embraces a racist romanticism to depict the "absent Indian"; Rifkin describes reading for such narrative dynamics as a textual practice of interpretation that "looks for the textual traces of quotidian ways of (re)producing the givenness of settler jurisdiction, placemaking, and personhood, attending to the means by which writings that feature neither Indians nor the expropriation of Native lands register the impression of everyday modes of colonial occupation."[97] Most American drowned town fiction does not feature Indigenous characters, but instead tells the story of large dam construction from the perspective of white settlers; nonetheless, as in Rifkin's theory of settler common sense, the nostalgia of these settlers for a mythical landscape before the flooding, or for a mythical

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white agrarian culture, naturalizes "settler jurisdiction" and other quotidian modes of occupation without explicitly engaging the dispossession of Indigenous peoples. Rifkin includes "the construction and maintenance of infrastructure" among the "governmental acts and agencies" that provide orientation for settler common sense.[98]

This chapter, then, offers textual evidence of white settler nostalgia in the context of large dam construction during the twentieth century, significant apparatuses in the "ongoing performance of quotidian modes of inhabitance and selfhood"[99] for nonnative people. In addition to exhibiting forms of settler common sense, many of the drowned town stories in American literature showcase elements of southern gothic. In part, it is not surprising that stories about displaced populations in the American South should contain the "strong sense of place, nostalgia for a lost past and a Lost Cause, and a history of defeat, articulated by white male writers" that is often associated with southern literature and southern gothic.[100] However, scholars of southern gothic have surprisingly little to say about infrastructure specifically, despite its transformative presence in the TVA. This specific absence in the scholarship might be a by-product of a popular perception that southern gothic is defined by murderous hillbillies and sinister spirits; but as Sarah Robertson observes in her discussion of Appalachian gothic, "much of the fiction from the region . . . presents outside, modernising forces as the villain of the piece"; in fact, she argues, "in Appalachia the terrible forces are far more often economic than spiritual."[101] This chapter illustrates the literary articulations of "modernising forces" in the form of large dam construction.

Mud on the Stars

With the successful 1942 novel *Mud on the Stars*, prolific professional Alabamian writer William Bradford Huie, son of a railroad agent and known for his controversial nonfiction works on race in America, penned a largely autobiographical *Bildungsroman*. His central character, Peter Garth Lafavor, is a descendant of Peter Garth, who was deeded three thousand acres for his service during the American Revolution. Garth Island, in the middle of the Tennessee River, exhibits turn-of-the-century race relations and, at least for Lafavor, is an ideal instance of American self-reliance. Lafavor attends the University of Alabama, where his understanding of racism and economic injustice is transformed by local student communists. Like Huie, Lafavor

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becomes a reporter. He covers the labor conflicts of the Birmingham mining and power companies, critiquing both the corporations and the unions, a reflection of Huie's own conservative politics. The climax of the novel sees Garth Island flooded by the TVA, an action depicted as an imposition of an increasingly socialist American government. Lafavor's "education" is represented by his eventual acceptance of the TVA, for which he goes to work, and whose utilitarian value he approvingly celebrates. *Mud on the Stars* is about agrarians learning to love modern industrial infrastructure.

"Mud collects on the stars. The ground feels hard and you toss about nervously."[102] The governing metaphor of mud follows Lafavor's education from naïve believer in the bootstrap theory to erstwhile communist in college to battle-hardened soldier. He never forgets his people are "the mud-bound multitude of the South . . . the people who are often duped by leaders who despise us."[103] Despite this understanding, he remains optimistic about his own plight and that of humanity in general. Lafavor's personal journey reflects a somewhat typical engagement of southern whiteness with the progressive agenda of the New Deal era, a struggle between individualist and agrarian ideals and dramatic federalist-driven technological transformation. Lafavor knows the classist oppression of his people in "this languid and bigoted world of the Tennessee which was the despair of the economist and the joke-butt of the sophisticated,"[104] but the arrival of TVA dams is not considered in the same frame of race and class: for the Garths, the only question posed by the dam is whether it will relieve their poverty. The damming of the river compresses the oppressive structures and presses impoverished people into the deprived world downstream from the dam: "And as the water grew shallower and more stagnant, the denizens of this pool were forced closer and closer to its mud bottom, and their poverty and ignorance and intolerance and filth were accentuated."[105] The imperatives of the TVA present the Garths with an inescapable dilemma, but Peter and the others never fully appreciate the parallels between their own dispossession and the dispossession of Indigenous tribes just a few generations earlier, facilitated approvingly by white settlers and the same federal government now being cursed as a socialist tyrant. Instead, "progress and its problems were prodding the Garths."[106] As the years pass and government promises about the local dam at Muscle Shoals providing new industries and cheap fertilizers fail to materialize, the dam becomes "a white elephant hopelessly entangled in red tape."[107] The

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"Great White Idol" becomes a "monument to false hope and Government inefficiency."[108]

When Peter attends university, two student communists, Harry and Addy, expose him to a world beyond the Tennessee Valley and its "bigoted" politics. On a boat trip to Muscle Shoals, Peter curses the government for not leasing the dam to Henry Ford, the industrialist and Nazi sympathizer who in 1921 proposed a private leasing scheme involving hydroelectric power and fertilizer plants, while Harry and Addy "envisioned the day when the dam could be the heart of a vast communal enterprise like the dam at Dnepropetrovsk."[109] The dam at Dnepropetrovsk reminds the reader of Lenin's famous declaration that "Communism is Soviet power plus the electrification of the whole country," which led to the 1920 formation of the State Electrification Commission (GOELRO). Construction of the Dnepropetrovsk Dam began in 1927, and electricity was produced in 1932. Dnepropetrovsk became a major industrial center. The Red Army destroyed the dam in 1941, part of the Soviet scorched earth policy during the German invasion, but it was rebuilt after the war. In this scene from *Mud on the Stars*, Huie deploys Henry Ford and the Dnepropetrovsk Dam as obvious synecdoche for the broad strokes of Cold War opposition between American capitalism and Soviet communism. Ford wanted to buy the Wilson Dam and two nitrate plants and transform part of northern Alabama into another Detroit; his plan ultimately failed, blocked in part by Senator George Norris of Nebraska, who in 1926 would table a bill to develop the Wilson Dam and build other dams on the Tennessee River, a plan that later became the basis for the TVA. Somewhat lost in the discussion between Peter and Harry, and certainly lost in the broader arguments of the novel, is Harry's comment to Peter about the structural violence on which the United States was built:

> "Garth, look around you," he said. "America hasn't been *built*. America has been *depleted*. Look at the end-products of this divine process by which you say your Garth world and America were *built*. What do you see? Disease. Ignorance. Stunted children. Slavery. A man shot down for trying to steal something to eat, and you commend your faithful slave for his watchfulness and steady aim. Is this your conception of a proper way of life? How can you call a process with such results a noble process?"[110]

This critique of progress is spoken by a communist character who will disappear from the novel in short order, and *Mud on the Stars* never seriously

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engages with the violent settler order on which the United States is erected, choosing instead to chart Peter Garth Lafavor's personal journey from libertarian conservative to New Deal liberal. Lafavor narrates his own struggle in terms that do not implicate him in a white settler order, but instead frame his coming of age in terms of "old" and "new":

> As a confused Old Southerner trying to be a New Dealer; as a chauvinistic son of Peter Garth with a devotion to some nebulous thing called Americanism; as a lover of the simple and the old, who had been taught to experiment with the complex and the new; and as an ordinary, curious American, I fought first with the one force and then with the other.[111]

From being an "obstructionist" against "the rush of the socialistic river"[112] to becoming a public relations employee of the TVA, Lafavor is subsumed by events seemingly beyond his control and left only with a nostalgia for an America that is gone and never to return.[113] *Mud on the Stars* thus establishes themes and characters that would become almost standard in most future American drowned town narratives: poor white agrarian characters who resist a state infrastructure agenda, only to find themselves in a seemingly hopeless situation that gives birth to a nostalgia that omits racist, sexist, and gendered violence in the "old way" of life. Often these characters have family histories connected to the Civil War and other military conflicts. As Lafavor narrates, "The land our fathers died for is to be covered by water which will generate electricity to be used in rebuilding the valley. Six months from today the Island will be only a memory."[114] The final insult in these narratives often involves the formerly oppressed going to work for the TVA, even, as in Lafavor's case, with a sense of admiration for its "scope and possibilities."[115]

Dunbar's Cove

Borden Deal's *Dunbar's Cove* (1957) fictionalizes the construction of the Chickasaw Dam; his preface to the novel thanks the director of information of the Tennessee Valley Authority and the workers at the Guntersville Dam and Lock in Marshall County, Alabama. The preface also pledges fidelity to the TVA and its practices: "I have attempted to make this book true to the practices, policies, and intentions of the Tennessee Valley Authority. I have striven for complete accuracy in every concrete detail of the construction and operation of Chickasaw Dam." What makes this framing of *Dunbar's Cove* interesting is the way in which the novel invokes racist and nationalist

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mythology to obscure any social realist imperatives. The novel opens with a racist ode to the civilizing mission of the TVA:

> This is the river. It is an Indian of a river, drunk sometimes on flood water the way only an Indian becomes drunk. It can be quiet, too, though not peaceful for the violence lies always beneath the quietness. It is not a blue river, not yet, but it will become so for this river is to be tamed and civilized as no other river in the history of civilization has been tamed and civilized. This is the Tennessee.[116]

Typical of white settler nostalgia, *Dunbar's Cove* regards Indigenous occupation of the territory prior to white settlement as a kind of nonoccupation, a historical absence. The absence of Indigeneity is mirrored by its phantom presence both on the land and in the Dunbar genealogy. Dunbar's Cove is located in a liminal space where "the Cherokees came to escape the white man," between "the plantation economy lapping up from the south and the land-hungry system of small farms and tiny industry encroaching from the north."[117] David Dunbar, the patriarch, is called "the white Indian" because he possessed "the wild, turbulent blood that gave him belonging"; he is considered "more white than Indian in blood but more Indian than white in thinking and believing."[118] Deal provides Dunbar's Cove with a romanticized liminality that does not upset the socially constructed racial order but provides the white settlers with socially constructed proximity to the land. Indigeneity is dead, removed, but it lives in the white settlers. In the words of Robert F. Berkhofer, "If Whites regarded the Indian as a threat to life and morals when alive, they regarded him with nostalgia upon his demise—or when that threat was safely past."[119]

Late in the novel, TVA representative Crawford Gates—who has simultaneously tried to convince Matthew Dunbar to leave the cove before it is flooded for a hydroelectric project and to court Matthew's daughter—presents Matthew, who refuses to leave his home, with a compensatory invitation to live at another cove, one that he thinks features many elements similar to Dunbar's Cove, so as to avoid a violent confrontation between Matthew and the TVA. Crawford teases: "No man has ever laid his name on this cove. It's been government land since it was taken from the Indians. It's yours, Matthew. Yours if you want it."[120] No "man" has ever named the cove being offered to Matthew as compensation for leaving Dunbar's Cove, because Indigenous people are not considered historical subjects. As such, when Matthew voices his lament for his own situation and the condition of many in the Tennessee Valley, he does not recognize a conspicuous parallel

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between his own displacement and the white settler displacement of Indigenous people:

> "One thing was forgotten for mankind," [Matthew] said, his voice heavy. "There ought to be a place, once in a while, where a man could stop and see where he is. Then, if he wanted to, he ought to be able to go back and start over again, with the knowledge and the wisdom that he's gained. Maybe, under that rule, we could do better."[121]

This type of settler blindness to the plight of Indigenous people displaced by infrastructure megaprojects is a ubiquitous feature of industrial capitalism, and only later entries in the subgenre of drowned town fiction begin to realize the scale of victimization and violence that underlies industrial infrastructure; Anne Michaels's *The Winter Vault*, discussed below, equates large dam construction with genocide. But for Deal in 1957, Matthew Dubar's departure from Dunbar's Cove marks the only meaningful erasure in the history of that territory: "Dunbar's Cove is empty and nameless again, for the name has gone with the man. It was laid on the land by a man, and taken away by a man, and the land is the same as it was before, when it bore the name and when it was nameless, for the land never changes."[122]

Deal mythologizes the TVA's practices in the Tennessee Valley, contrary to his prefatory remarks, he mythologizes the land by erasing Indigeneity, and he mythologizes the dam by conjoining it with racist notions of civilizing power:

> Elsewhere, though, the tamed water of this wild river is running with turbid twisting power through smooth steel turbines, and its strength is lighting flames over the land. These are the new flames, encased in vacuums as is the modern way, instead of the old open flames with heat and warmth. But these new flames will last—they, too, are permanent throughout the time of man.[123]

Curiously, Deal also mythologizes the temporality of infrastructure. In the passage above, he transforms the "wild river" that is synonymous with Indigeneity into an industrial fire without end, a potent myth that fueled industrial expansion and now must confront its impermanence.

The idea that the hydroelectric project is "permanent" obviously conflicts with the science of dam construction. Most sources estimate the average lifespan of a dam at 50 years. Deal deploys the supposed permanence of the dam to suggest much more than simply indefinite functionality of a technical object; Crawford calls the dam "the mightiest thing that God

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or man ever brought to this country"[124]—later he escalates the promise and assures that "TVA is going to do more for this country than God ever did"[125]—and the dam represents the promise of ideological permanence. Concrete endurance equates with ideological certainty:

> For they [TVA] knew a great truth: each yard of concrete poured is an accomplishment that the future cannot alter. Politicians and propagandists can sway the human mind far out of kilter—but they cannot alter a yard of concrete. Concrete is as real as reality, it is a word for reality itself, and the young men poured their concrete with controlled abandon, in the knowledge that each yard, each cofferdam, each spillway, was a buffer against the future disillusionment of age. They knew that they were building for the centuries.
>
> But TVA is more than concrete, more than spillways and generators and the calculated dropping of water-levels two feet at just the proper time to slay the malarial larva. Above and beyond the concrete reality is the idea, the impact, and the myth.[126]

This passage recalls Sneddon's "lingering" assemblages, with the notable exception that the durability of ideology here is entirely material and not human or semiotic. "Concrete is as real as reality," even though it is by definition synthetic. Deal follows this apparent contradiction with another: more important than the "reality" of concrete is the "myth," but myth is typically a discursive category associated with "politicians and propagandists," actors who in this description are pliable stewards of persuasion incapable of matching the immutability of concrete. Later in the novel Deal seems to contradict his dichotomous pairing of concrete and myth when he writes, "Within the concrete will be embedded the reasons for its being."[127] At work among these apparent contradictions are the utopian fantasies of technophilia, which erases the Indigenous past and falsely projects large dam construction as a "buffer against the future disillusionment of age," the type of techno-utopian salvation history that predates the twentieth century.[128]

The Waters of Kronos

Nostalgia is also an integral part of Conrad Richter's 1960 novel *The Waters of Kronos*, winner of a National Book Award. Similar to *Mud on the Stars*, Richter's novel is a semiautobiographical story. Richter was born in Tremont, Pennsylvania, and the novel relates the return of John Donner from the west coast to Unionville, Pennsylvania, where he grew up. Unionville has been flooded as part of a hydroelectric project in the region. Much like

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the previous drowned town novels, *The Waters of Kronos* mythologizes the land, the water, and the people of a place and era that have disappeared; but unlike those earlier novels, this one also exposes the central character's childhood misunderstandings of the town, an act of memory that marks a narrative trajectory from social to psychological realism. The flood and dam separate John from the ancient pedigree of a mythological unspoiled territory: "He had entered the shadow of the Gap and saw Kronos, the mysterious dark river, running beside the road, old as the earth it came from, rising in the spring sands of a score of mountains, trickling down ravines and hollows, watering ferns and mosses, swelling in hundreds of runs."[129] Later, the "river made mysterious occult gurgling noises beneath him."[130] The forces of nature contained by the dam have a primordial power familiar to the gothic tradition, an abjective liminality that manifests in the novel as an interior journey for Donner, who quickly finds himself in the town of Unionville before it was flooded. The concrete dam is "like the white end of a colossal burial vault whose lid was blue water running back for miles, shutting in forever his grandfather's Vale of Union, reaching high on the hills and clasping every hollow."[131] Similar to earlier drowned town novels, the genealogy that has been buried by the dam and reservoir traces back to the American Civil War and beyond. The historical affinity of the settlers to the land is established; and "modern progress" embodied by the "turbines down in their concrete power house," though it "benefitted humanity," still represents "a glimpse, small as it was, into an abyss whose unfathomable depths were shrouded in mist, a bottomless chasm that he had known existed, if only in the back of his mind and in the back of everyone else's mind, but which he had never seen face to face or directly looked down into before."[132] Richter presents "modern progress" as a radical ambiguity, simultaneously a benefit and an abyss in the back of his mind, in stark contrast with Borden Deal's promise of the unending benefits of hydroelectric power.

Before John Donner becomes fully immersed in an alternate reality or psychological journey to pre-flood Unionville, a local security guard escorts him to the place of the relocated cemetery plots from Unionville. In response to Donner's emotional reaction to the material reality of a town drowned and the dead transferred, the guard says, "Well, maybe now you know how the Indians felt when you run them off their land."[133] The remark does not receive more consideration, but nonetheless is a rare and

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significant acknowledgement of Indigenous dispossession in the American drowned town subgenre. Donner makes his own reference to Indigeneity later in the novel, with reference to his recognition of the inevitability of decay and death: "Well, the old must steel themselves to the obscuring of familiar sights, become resigned to an existence in mist and veil. The pueblo Indians of New Mexico were wise to build their houses of earth, to become accustomed to dwelling in the clay of their final resting place."[134] Contrary to Deal's confidence in progress and the immortality of concrete megastructures, Richter displays a sensibility in John Donner much more consonant with conviviality and a societal materiality cognizant of existential parameters. Donner's nostalgia is not divided between the apparent necessity of progress (for "humanity") and his personal desire; Donner travels back to the "slow peaceful place he had known as a boy,"[135] and Unionville, though it does present many surprises that problematize Donner's nostalgia for it, remains the classic agrarian setting, "the combination of town and woods, life going on in [these] houses under the trees, eating, sleeping, reading, making meals in the kitchen all beneath the giant limbs."[136]

Part of the nostalgia in Donner's psychic journey in *The Waters of Kronos* includes the notion that Unionville is unique: "the whole town was a living museum of people and places the like of which, once gone, would never be seen again."[137] While part of an agrarian nostalgia for the disappearance of small towns and their proximity to nature, this sentiment also reflects the psychological meditation in *The Waters of Kronos* that separates it from earlier drowned town novels: Donner travels back in time to interact with a Unionville that is not the same as the town he remembered. The dam and reservoir spatialize temporality, freezing and then disappearing the history of the town and its people but not beyond the reach of the kind of memory exercise John Donner (and Conrad Richter, as novelist) is practicing. Behind the dam and beneath the reservoir lie suppressed memories both collective and individual. Donner encounters Dunkard Church, an old church built along with a large dam back in the 1820s to support the local canal. The dam broke during the Civil War and flooded Unionville, "an omen and symbol of the future that few had paid attention to then."[138] Donner recovers from memory a symbol of the perils of progress, something he could not have understood as a child. He also learns to critique his own nostalgia for the town, as he wanders its pre-flooded streets and "tasted a strange bitterness in the air as if the unhappy Unionville dead

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released by the hour were abroad in the town, trying like he to find solace on the streets where they had walked before, leaving trails of melancholy and despair. He puzzled over the deep insupportable sadness."[139] By the end of his journey, Donner sees the entire history of Unionville and the reservoir in which it now stands immersed as enveloped by the irrational, the dreamlike, the unconscious. Instead of feeling a reactionary reverence for nostalgic inclinations, Donner now feels he "had found a part of what he sought."[140] The relationship of the dam to his past is not as inert as the infrastructural nostalgia in other drowned town fictions. *The Waters of Kronos* maps an assemblage of infrastructure and consciousness, an ephemeral vector for which the lingering assemblages of monument, geography, and politics constantly shift.

Flood: A Romance of Our Time

Noted southern novelist, poet, and critic Robert Penn Warren approved of the TVA.[141] Nonetheless, his 1963 novel *Flood: A Romance of Our Time* mourns the passing of the agrarian South as TVA hydroelectric projects transform its landscape and culture. Set in the fictional town of Fiddlersburg, Tennessee, *Flood* is the first American drowned town novel to juxtapose the engineering megastructure of the large dam with the emerging media spectacle in the United States. *Flood* embodies spectacle in the characters of Brad Tolliver, native son of Fiddlersburg, and Yasha Jones, a celebrated film director, both of whom are returning to Fiddlersburg to make a fictional film about the town before it disappears beneath the water of a reservoir. The world of Fiddlersburg has already been engulfed by spectacle, as critic William Bedford Clark notes: "The America of false façades, of tinseled glamour, of fairy-tale self-deceptions—an America Brad and Yasha have had a hand in making—has already buried all but the last vestigial remnants of the America that was, a world that now seems only available through a nostalgic and sentimentalizing reverie."[142] But Tolliver and Jones will discover, in a narrative turn reminiscent of *The Waters of Kronos*, that the sentimentalized image of Fiddlersburg does not match the reality. Warren maintains a humanist distinction between authentic and fake existence, and the opening pages of *Flood*, which detail the return of Brad Tolliver, portray concrete as the material of the "fake" life that has replaced the authenticity of agrarian naturalism. Tolliver notes immediately the newly constructed road on the approach to Fiddlersburg: "In those years the road

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had been blacktop. Now it was concrete. New concrete."[143] He pauses at the Seven Dwarfs Motel, not far from Fiddlersburg. Hollywood arrived in Fiddlersburg long before the famous director Yasha Jones. The motel chain foregrounds the imposition of what Warren considers "fake" mass culture onto the idiosyncratic authenticity of southern towns. Decades before Jean Baudrillard posited Disneyland as a site of simulation that participated in the destruction of the real, it was already an icon for cultural erasure and empty signification. Brad Tolliver enumerates the cement features of the Seven Dwarfs Motel decorations:

> But the trouble was not so much what was not there. It was what was there. The creek was there, but it flowed decorously between two banks where stones were mortised into the earth; and on a boulder a cement frog, the size of a young calf and the color of Paris green, with a mouth gaping as richly bright as a split liver on a butcher's block, crouched. On another boulder a gnome, dwarf, brownie or some such improbability, with a cement beard painted snow-white, sat studiously fishing. The line with which the creature was fishing was a real line. It wavered with the motion of the stream. The water in the stream looked real. But the water lilies were definitely cement.
>
> Bradwell Tolliver wished that the water did not look real. What always worried you was to find something real in the middle of all the faking. It worried you, because if everything is fake then nothing matters.[144]

The dam that will soon flood Fiddlersburg is an extension of this paved world with its concrete gnomes and water lilies. For Warren, the spectacle concretized marks a symbolic death of southern culture; the stone pastoral in front of the motel signifies dramatic and permanent change, the mortification of the old world. As Brad somewhat sarcastically tells Yasha shortly after their arrival in Fiddlersburg, "As Fiddlersburg, with its wealth of Southern tradition, unassuming charm, homely virtue, and pellagra, sinks forevermore beneath the wave, the Seven Dwarfs Motel will rise in spray, glimmering like a dream."[145] What the novel reveals is that this comfortable dialectic framed by an outsider, the notion that the "Southern tradition" sinks in proportion to the rise of the spectacle "like a dream," bears the burden of nostalgic historicization, and the southern tradition and "unassuming charm" conceal the social agonisms to be found in all human societies, agrarian or industrial. One thing that Brad understands well, however, as a witness to the rise of industrial capitalism beyond Fiddlersburg, is the tenor of what follows dam construction, and the contempt he has for the culture that supplants the agrarian:

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> Whenever they put in one of these big river projects the whole new lake for seventy-five miles gets cluttered with docks for spun-glass speedboats and Chris-Craft cruisers and guys with Hawaiian batik shirts hanging outside the belt and occasionally parting in the slight breeze of a Tennessee summer, temperature 98°, humidity absolute, to permit the fat character to toy with the manly hair on his belly and drain the sweat out of the navel. They put up motels, with kitchen facilities for the family vacation and with more cozy accommodations for adultery among nature-lovers.[146]

Flood analyzes the epiphanic moments prior to mortification, the revelations in the shadow of large dam construction. A local farmer and lawyer named Blanding Cottshill articulates the temporality in which the novel occurs: "But you know, that moment when some place is just overpassed but still extant and waiting for the flood, that's the time when you can see its virtues and vices most clearly. Like that queer light before a storm in summer."[147] The dam forces the locals to seek an existential clarity. As Cal Fiddler tells Brad late in the novel, "You sit in a place like this . . . and you think about the past because there isn't any future."[148] Filmmaker Yasha Jones arrived in Fiddlersburg in search of "the human moment in the midst of the land," a moment of "preciousness," but he has not managed to find it.[149] Yasha waxes existential for the duration of the novel, at one point recalling the people of Pompeii buried by volcanic ash: "I used to feel that I was in Fiddlersburg like that, that if the ash fell—or maybe it had fallen already—somebody a thousand years later could pour in the plaster and get, you might say, the shape of my life. There wouldn't be any me in that hole, just the emptiness—maybe there had never been any real *me*."[150] Brad experiences the same anxiety, comparing the silence of his darkened home one night to "a rising flood" and believing that he was "discovering a buried self," a "true self that would live forever."[151] The construction of the dam and flooding of Fiddlersburg provide the dramatic compression and sense of urgency that everyday life typically does not demand.

Much of Brad and Yasha's time in Fiddlersburg entails learning about the melodramatic ailments of the townspeople in the shadow of impending doom and historical erasure. The melodrama provides a narrative scaffolding for the emergence of counternostalgic revelations. Maggie Fiddler reveals the decay of the town, both physical and spiritual, despite its nostalgic veneer. She encourages her visitors to look at the river that runs through Fiddlersburg and "see all the trash and broken bottles and old shoes and

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rusted tea kettles and empty tin cans and sprung corset stays that ever came out of this house in a hundred and fifty years. . . . By daylight, she said, you'll see, too, that we're falling to pieces here."[152] Technofixes cannot erase the fundamental pain and struggle of human existence, nor are they immune to entropy. But like the other TVA-inspired novels of this period, *Flood* allows an engineer from the hydroelectric project to speak for its progressive aspirations:

> The dam was going to be great, the young engineer said. Going to be near a hundred square miles under water, going to back up the water for twenty-five miles, he had said, gesturing south, up-river. Most of the land not much but swamp or second growth. And what good land there was—hell, they didn't know how to farm it anyway. But with power and cheap transportation it would all be different. A real skyline on the river, plant after plant. Getting shoes on the swamp rats too, teaching 'em to read and write and punch a time clock, and pull a switch. It was going to be a big industrial complex, he said. He liked the phrase, industrial complex.[153]

Clearly, for Warren, even though he was a proponent of the TVA, the notion that "it would all be different" once the South had "power and cheap transportation" was hopelessly naïve, and the form of the novel allows him to trace the micropolitical valences of agrarian spaces, nostalgic narratives, the myth of progress, and the banalities of human conflicts in the context of large dam construction without offering reductive conclusions about their multiple combinations. The passage above describing an engineer's appraisal of TVA operations in Tennessee echoes the more comically exaggerated monologue of George Clooney's character Ulysses Everett McGill at the end of the Coen brothers' film *O Brother, Where Art Thou?* (2000), as he floats on floodwaters that just saved his life from a devilish sheriff about to hang him and his fellow travelers:

> "Well, any human being will cast about in a moment of stress. No, the fact is, they're flooding this valley so they can hydroelectric up the whole durn state. Yes, sir, the South is gonna change. Everything's gonna be put on electricity and run on a paying basis. Out with the old spiritual mumbo jumbo, the superstitions, and the backward ways. We're gonna see a brave new world where they run everybody a wire and hook us all up to a grid. Yes, sir, a veritable age of reason. Like the one they had in France. Not a moment too soon."[154]

The film demonstrates, of course, the inherent foolishness of this sentiment, combining a Homeric epic quest with hayseed tropes in a tale of human frailty that hydroelectricity will not refine. While the earlier drowned

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town novels foregrounded nostalgic reverence for the disappearance of the agrarian way of life—and many novels in this subgenre would continue to favor this theme—*Flood* never allows such nostalgia to obscure enduring existentialist anxieties and struggles. At one point in *Flood*, Brother Potts describes the challenge of consoling the Fiddlersburg locals who are "bitter in the heart" because they feel "all their living was somehow for nothing," now that the town is being flooded.[155] Unlike the locals who feel cheated by the flood, Yasha Jones feels a kind of joy: "he had stumbled upon this place, and its doom, and the place and doom would give him—in spite of, no, because of, his very abstraction from place and event—the perfect image of his pure and difficult joy."[156] Mr. Budd, a local whose father was a prison guard who became famous for being too "yellow" to pursue some escaped prisoners, experiences a "grim joy" at the thought of the flood "and how he would be here alone where he had always wanted to be."[157] Brad Tolliver wonders if the real reason he returned to Fiddlersburg was "to lie in the mud and weep,"[158] just as his father seemed destined to go back to the swamp, a familial *nostalgie de le boue*.[159] As the floodwaters rise and the dam's inevitability encroaches, everyone in the novel must confront inescapable existential trials. Brad had blamed "Fiddlersburg because it was not the world and, therefore, was not real,"[160] but ultimately he decides that "*there is no country but the heart*," as his eyes moisten and he watches "the chrome and safety glass of cars passing on the new highway, yonder across the lake,"[161] a melodramatic collapse of the spectacle and agrarian authenticity into existential pathos.

The Orchard Keeper

Cormac McCarthy's father was a member of the TVA's legal staff from 1934 to 1967 and spent the final decade as its chief counsel. His son's first novel *The Orchard Keeper* (1965), the first of a trilogy of novels based on his youth in Tennessee, portrays the impact of modernization on the rural inhabitants of eastern Tennessee. While *The Waters of Kronos* includes the gothic element of a river with occult connotations and *Flood* depicts the South in decay and besieged by mass culture, it is McCarthy's *The Orchard Keeper* that marks the first thoroughly gothic entry in the drowned town subgenre; perhaps ironically, *The Orchard Keeper* also features the work of the TVA primarily as a historical apparition that haunts the mountain folk of the novel, instead of a construction project and bureaucracy concomitant with the

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novel's events. *The Orchard Keeper* opens with an image that encapsulates the gothic character of a rural South in decline: a group of men unsuccessfully trying to saw the base of a tree in which "twisted wrought-iron" from a fence has become entangled.[162] Industrialization, made possible by the TVA, has become embedded in the landscape of the South, a rusted ontology that is a sociohistorical complement of McCarthy's fascination with ubiquitous evil and mystery.[163] For Lydia R. Cooper, *The Orchard Keeper* "is not a novel about the erosion of morals or civilized behavior with the onslaught of civilization, but a novel that illuminates how the patina of social laws . . . cover over the more insidious forms of evil that infect everything from individuals to the ecological balance of the natural world."[164] Cooper's reading of the novel foregrounds an essential ingredient in McCarthy's fiction, but she overstates the degree to which "the onslaught of civilization" is a secondary feature. For Cooper, the image of the iron fence embedded in the tree, in addition to being "a graphic image of the infection of industrialization in the natural world," also "suggests the permeation of corruption rampant in humans as well as the natural world."[165] This interpretation stretches the image beyond its heuristic potential. While *The Orchard Keeper* certainly features what might be called "insidious forms of evil that infect everything," the driving force of the novel, from the twisted wrought iron in the tree to the concrete pit that hides the ashes of an evil man to the gravestone visited by the protagonist at the end of the novel, is the arrival of modernity in the form of the TVA and its concrete dams, though they may remain largely invisible in the novel, much as the mountain folk by novel's end are "myth, legend, dust."[166] The world of Blount County in *The Orchard Keeper* is harrowing because of both a pervasive evil and a sociohistorical manifestation in the form of the TVA. By the end of the novel, the workers who were sawing the tree stump have departed, "leaving behind their wood-dust and chips, the white face of the stump pooling the last light out of the gathering dusk."[167] Industrial capitalism destroys and departs. The recently embedded world of industrialization transforms human potential, even if one believes in supernatural concepts such as evil, even in the long view of McCarthy's gothic vision, in which "the significance of the human and of the humane is at times all but erased, canceled out by overwhelming forces of darkness and devastation."[168]

The Appalachian roads of eastern Tennessee do not impose infrastructure on the landscape so much as they are deformed by the "small ridges

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and spines" of the mountains "that contort the outgoing roads to their liking."[169] This is a vision of a land ancient and unyielding. The forest floor "has about it a primordial quality, some steamy carboniferous swamp where ancient saurian lurk in feigned sleep."[170] Adjacent to the TVA-driven modernity is the decaying community of Red Branch, where "gangrenous molds" affect the foundations of homes before the roofs are completed[171] and the people stare "out across the blighted land with expressions of neither hope nor wonder nor despair."[172] White Appalachian culture is depicted as so old it is mythical; Ef Hobie's family, for example, was "a whiskey-making family before whiskey-making was illegal, their family history mythical, preliterate and legendary."[173] The declining mountain culture of Red Branch is just a one-hour drive from Knoxville, where the TVA located its headquarters; Dianne C. Luce posits that "TVA brought more dramatic change [to Knoxville] than the Depression itself."[174] TVA engineers "destroyed the farmlands of hundreds of families and permanently altered the traditional culture of the region."[175] The titular orchard keeper in Red Branch, "Old Man" Arthur Ownby, retreats to the mountains among the "dark forests of owl trees, bat caverns, witch covens,"[176] where he oversees an orchard pit in which the corpse of Kenneth Rattner, killed by Marion Sylder in self-defense, was buried. The corpse's concealment obscures from John Wesley Rattner, son of Kenneth Rattner, that the man he befriends, local whiskey runner Marion Sylder, is actually his father's killer. Arthur's decision to live alone in the mountains "marks his choice of nature, traditional mountain culture, and personal freedom over civilization, modern technology, and governmental regulation."[177] The orchard long ago "went to ruin,"[178] and now Ownby watches over the spray pit, "a concrete tank set in the ground that once had been used to mix insecticide," as a "crypt."[179] This central image of an orchard turned into a crypt captures the transition from subsistence living in Red Branch to the death of an entire culture as a consequence of the TVA. Subsistence living, including hunting, has disappeared as the habitat for common prey disappeared.[180] The habitat was eviscerated by "logging industry practices and careless international trade," and contributed to Arthur Ownby's and John Wesley's "abiding perception of a diminished world."[181] The extreme poverty of Red Branch is typified by the Rattner family, who squat in "the oldest house in the county"[182] and burn a loom from the loft as kindling because people in the area no longer make their

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own clothes.[183] Here in the "cobwebby gloom"[184] John Wesley's mother coaches him never to forget his father, and to seek vengeance on the person who killed him.

Settler common sense surfaces in *The Orchard Keeper*, a story without major Indigenous or Black characters. While not foregrounding the infrastructural forms of renewing settler governance, such as the TVA dams, and only occasionally engaging legal forms of settler governance, *The Orchard Keeper* includes reinscriptions of the "the givenness of settler jurisdiction" such as this conversation among Boog, Johnny Romines, and John Wesley, all mountain folk:

> Which'd you rather be, Boog asked John Wesley, white or Indian?
>
> I don't know, the boy said. White I reckon. They always whipped the Indians.
>
> Boog tipped the ash from his cigarette with his little finger. That's so, he said. That's a point I hadn't studied.
>
> I got Indian in me, Johnny Romines said.
>
> Boog's half nigger, said Warn.
>
> I ain't done it, Boog said.
>
> You said niggers were as good as whites.
>
> I never. What I said was *some* niggers is good as *some* whites is what I said. . . .
>
> John Wesley didn't say anything. He'd never met any niggers.[185]

The conversation reveals their respective insulation from Black and Indigenous communities, their ingrained racism, and their white supremacist sense of history. As in earlier drowned town novels, Black and Indigenous characters are absent, but the white characters claim a form of embodiment based on blood genealogy. The absent presence of Black and Indigenous people in Red Branch enables nonnative characters to claim a connection to the soil and a sociohistorical supremacy without directly confronting colonial dispossession and accumulation. *The Orchard Keeper* also contains evocations of slavery, another essential component of southern gothic and white settler common sense. Some of these evocations reinscribe white supremacist violence in the social order of the mountain folk, such as the story about "old man Hobie," now deceased, who terrorized a local Black church until "he run em ever one off."[186] When Arthur Ownby was a boy, he knew a woman who was a former slave. While the history of slavery is particularly important to southern gothic, in *The Orchard Keeper* this history remains distant, only occasionally surfacing to illustrate the typically racist dispositions of local men, and in the case of Arthur Ownby his relation

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to slavery is an experience of Appalachian magic, part of the supernatural order that informs southern gothic:

> When he was a boy in Tuckaleechee there was a colored woman lived in a shack there who had been a slave. She came back there because, as she said, there weren't any other niggers and because she felt the movements and significations there. She wore a sack of hellebore at her neck and once he had seen her on the road and hadn't been afraid of her, as he was very young then, so she put three drops of milfoil on the back of his tongue and chanted over him so that he would have vision. She told him that the night mountains were walked by wampus cats with great burning eyes and which left no track even in snow, although you could hear them screaming plain enough of summer evenings.[187]

According to folklore, the hellebore plant can be used to summon demons. Milfoil, also known as yarrow, is a perennial associated in witchcraft with various spells, including divination, and with healing powers. Wampus cats are part of east Tennessee folklore, a spirit connected to the earth and death. Arthur's childhood encounter with a former slave who is a witch demonstrates his apparent courage in the face of the unknown; but it also serves to instill in him a recurring unconscious fear, symbolized by the cats he sees in dreams and occasionally in waking moments. For example, after he is arrested for shooting at government agents and a tank that was left on his property, an agent for the Knox County Welfare Bureau visits him in jail. When the agent departs, "his steps were soundless and he moved with a slender grace of carriage, delicate and feline."[188] The folkloric trappings of eastern Tennessee permeate the experiences of the locals to such an extent that even hydroelectric assemblages and modernist pretensions cannot displace traditional myths and fear-inducing superstitions. Is Arthur a visionary of some kind, or just the product of a childhood immersed in religious superstition? The tension of these possibilities returns in various forms of southern gothic ambience, such as the "ghosts of mist" that rise from the paved road through the mountains[189] or the "shells of ossified crustaceans from an ancient sea" that jut from the side of a bluff.[190] The ancient and occult milieu of McCarthy's gothic Tennessee, which often gestures beyond the premodern to the prehistoric, shapes urban space as a concrete manifestation of the mystical and grotesque. When John Wesley visits the city, "*steamed and weaving in heat,*" he sees "*the bare outlandish buildings, towering columns of brick adorned with fantastic motley; arches, lintels, fluted and arabesque, flowered columns and crowstepped*

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gables, baywindows over corbels carved in shapes of feet, heads of nameless animals, Pompeian figures." The "*gargoyled and crocketed*" buildings belong to the same gothic order as the haunted and violent rural landscape.[191] In this context, where both undefiled forests and the garishly engineered mausolea of the city exhibit genealogical continuations of a malevolent preternatural order, infrastructure embodies a reproduction of "quotidian settler structures of feeling,"[192] but not in the traditional dichotomy of modern order and premodern chaos; instead, settlers feel nostalgia for a world of subsistence living and superstition, and urbanization becomes just another manifestation of an ancient and malevolent order that inhabits everything.

Deliverance

James Dickey's critically acclaimed novel *Deliverance* (1970) inspired a critically and commercially successful film of the same name in 1972. The film, starring Jon Voight, Burt Reynolds, Ronny Cox, and Ned Beatty, opens with a shot of treetops emerging from a lake and voiceover dialogue explaining the impending flooding of the fictional Cahulawassee River valley; this image transitions into an aerial shot of the dam under construction. These visual evocations of a hydroelectric assemblage are likely more potent reminders of the milieu in which *Deliverance* takes place than anything in the novel, which begins with Lewis, an outdoorsman and patron of survivalist culture, explaining to his friend Ed, a graphic artist from Atlanta, that the dam near Aintry was under construction and soon the valley would disappear under water. "We really ought to go up there before the real estate people get hold of it and make it over into one of their heavens," Lewis urges.[193] Four middle-aged friends decide on a whitewater rafting adventure, before the valley is flooded and all its wilderness is lost forever. The decision has infamously horrific consequences, including murder and sexual assault, and the survivors struggle with their agreement to conceal the truth about what happened during their trip. Unlike earlier drowned town fiction, *Deliverance* does not dwell on the elements of dam construction—human dispossession, lost cultures, conflicts over real estate, encounters with the construction company or government officials, and so on—but instead features the flooding of a valley as a framing device for thematic considerations of human nature and (sub)urbanization. Most commentators have emphasized the apparent contrast in the novel between the primordial

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premodern mountain culture and the effete sensibilities of the suburban adventurers. The novel treats the mountain dwellers more ambiguously than the film: in the novel, especially in the eyes of Lewis, "the mountain folk's very backwardness and social isolation has allowed them to retain a physical and mental toughness and to preserve a code of commitment to family and kin that has long ago been lost in the rush to a commodified existence."[194] In the film, the mountain people exist primarily as deformed and dangerous denizens of the north Georgia wilderness, caricatures of the Other to the modernist subject. As in *Flood*, the gradual formation of the dam precipitates existential crises; in this case, the suburbanites venture into unfamiliar settings and confront the limitations of their urbanized habitus. Instead of nostalgia for an agrarian lifestyle, as witnessed in *Flood*, the suburbanites of *Deliverance* seek an experience with pristine wilderness. The novel foregrounds the erasure of wilderness but problematizes the classic presentation of wilderness as benevolent and sublime.

Like earlier drowned town novelists, Dickey marks the boundary between urbanization and wilderness according to the contour of the road: "The highway shrank to two lanes, and we were in the country. The change was not gradual; you could have stopped the car and got out at the exact point where suburbia ended and the red-neck South began."[195] Lewis lectures the friends on the wilderness of the valley they are going to visit, characterized by "bad roads" but a portion of the river that "would knock your eyes out."[196] Lewis's survivalism is not so much a nostalgia for a traditional way of life as it is a response to the precarity of modernization. "I think the machines are going to fail," he tells his friends, "the political systems are going to fail, and a few men are going to take to the hills and start over."[197] The complexity of modern technosocial assemblages convinces Lewis not only that their collapse is likely, but that collapse is desirable: "Life is so fucked-up now, and so complicated, that I wouldn't mind if it came down, right quick, to the bare survival of who was ready to survive."[198] Infrastructural breakdown (or destruction), for Lewis, represents the possibility of a new life, a break with bourgeois society. Ed fantasizes about a new life during sex with his wife Martha, in the banal form of a fantasy about a photography model who worked at his studio:

> It was the heat of another person around me, the moving heat, that brought the image up. The girl from the studio threw back her hair and clasped her breast, and in the center of Martha's heaving and expertly working back, the gold eye shone,

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> not with the practicality of sex, so necessary to its survival, but the promise of it that promised other things, another life, deliverance.[199]

Lewis, the survivalist superman, sees deliverance from modernity in technological failure. Ed, the feeble, married graphic artist, fantasizes of deliverance from his bourgeois identity in more abstract terms, another life constructed within the same technosocial container. Can human beings be delivered from their sense of lack, or, as in Warren's *Flood*, is there an essential existential inadequacy that no amount of technological sophistication or untrampled wilderness can alleviate? While the early drowned town novels promised TVA-engineered deliverance from the poverty of the Deep South, the entries in this subgenre from the 1960s and 1970s focus more intently on human fallibility and ennui that escape technological engineering.

Deliverance also resembles *Flood* in its concern for the impact of mass spectacle on the perceptions of its suburbanized protagonists. The novel's narrator, Ed, enters the wilderness with only phantom images of cinematic survivalist behavior: "Movies and pictures of Indians on calendars gave me a general idea of what to do, and I waved the paddle slowly through the water, down and along the left side of the canoe."[200] The "invisible Indian" is now not a memory but a media spectacle. Later, when he and Bobby are confronted by two local men in the woods, Ed reacts again fully cognizant of his imitation of the spectacle: "I half-raised my hands like a character in a movie."[201] After the violent encounter with the locals and on the run from the survivor, Ed describes the terrain: "From where we were the cliff looked something like a gigantic drive-in movie screen waiting for an epic film to begin."[202] Ed even imagines his struggle to negotiate the terrain as a hazy intention, "like an old movie that just barely held its own on the screen."[203] After Ed, Bobby, and Lewis survive the ordeal in the backwoods, Ed counsels the others on maintaining a coherent story to give to the police: "Remember your movies; police like to separate suspects and try to get them to contradict each other."[204] And it is Ed who, in an effort to befriend the local sheriff, tells him, "You ought to be in the movies, Sheriff."[205] *Flood* foregrounds the concrete imprint of the spectacle, in the form of Disney caricatures in stone and newly paved concrete roads, but *Deliverance*—also written by a southerner who, like Warren, had been US poet laureate—equates the spectacle more with a sensibility or perspective.

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In *Flood*, the TVA and its attendant apparatuses of modernization have transformed the *space* of the South, while in *Deliverance* the primary conflict is between southerners who understand the wilderness and southerners who know only what mass media tell them, a primarily ideological or psychological transformation.

Deliverance performs an erasure akin to the broader global movement of large dam assemblages: bourgeois forces compel the construction of the dam, which destroys huge swaths of wilderness and dispossesses poor (hill) folk. After the murder of one of the local woodsmen, Drew encourages Ed, Lewis, and Bobby to consider their chances in court if they should confess to the killing: "Everybody up here is kin to everybody else, in one way or another. And consider this, too: there's a lot of resentment in these hill counties about the dam. There are going to have to be some cemeteries moved, like in the old TVA days. Things like that."[206] The dam resonates in sociopolitical effects beyond the immediate technological transformation of the valley. The flooding also provides the bourgeois friends with an erasure of convenience, contrary to the previous drowned town novels that focused on melancholy over the loss of a settler culture. Lewis sees the coming flood as a historical concealment that will disappear their crime, abetted by classist disdain for the poor:

> "These woods are full of more human bones than anybody'll ever know; people disappear up here all the time, and nobody ever hears about it. And in a month or six weeks the valley'll be flooded, and the whole area will be hundreds of feet under water. Do you think the state is going to hold up this project just to look for some hillbilly?"[207]

The dead local woodsman may have anti-TVA community resentment on his side, but the suburban adventurers have the structural violence of infrastructure, a more powerful and enduring force of erasure. The question posed by Lewis about the value of the life of one "hillbilly" can be extended in a form of synecdoche to include the entire history of industrial capitalist infrastructure and its relationship to the oppressed: For what might the infrastructure project, the colonial project, the capitalist project *cease* operation? Thus far the answer is almost nothing, certainly not for the needs of the poor. The oppressor can hide crimes of unspeakable scale beneath the waves, beneath the concrete, beneath the displaced soil. *Deliverance* concludes with Ed reflecting on the burial of their crime under the newly flooded valley:

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> I went through both daily papers from column to column every day, but only once did the word Cahulawassee [the fictional name for the Chattooga River] come off the page at me, and that was when the dam at Ainty was completed. The governor dedicated it, there was a ceremony with college and high school bands, and the governor was said to have made a very good speech about the benefits, mainly electrical and industrial, that the dam would bring to the area, and touching on the recreational facilities that would be available when the lake filled in. Every night as the water rose higher I slept better. . . . From the beginning of the inundation Drew and the other man were going deeper and deeper, piling fathoms and hundreds of tons of pressure and darkness on themselves, falling farther and farther out of sight, farther and farther from any influence on the living.[208]

The disappearance of mountain culture in *Deliverance*, much like in *The Orchard Keeper*, performs an erasure of otherness by modernity, and bears a similarity to white settler guilt over the genocide of Native Americans. Dickey changed the name of the Chattooga River to the fictional Cahulawassee, another form of erasure since the Chattooga River was part of Cherokee land until 1816. The Cherokee were forcibly removed from north Georgia, where *Deliverance* takes place, after gold was discovered in their territory. Thousands of Cherokee would die in what became part of the Trail of Tears. The novel *Deliverance*, then, illustrates how infrastructure buries people and cultures, not only in the form of the murdered mountain man and the flooding of the valley, but also in a metatextual burial of the Chattooga River and its Cherokee heritage. While many of the other drowned town novels remember Indigenous history, even when they largely ignore it, *Deliverance* actually performs a literary displacement of Indigenous culture, while depicting a mountaineer culture that lives with a proximity to the land.

One Foot in Eden

One of the scenes in the movie *Deliverance* was filmed at the Mount Carmel Baptist Church cemetery, which now lies beneath Lake Jocassee, South Carolina, flooded in 1971 by the Duke Power Company. South Carolinian author Ron Rash sets his 2002 novel *One Foot in Eden* in the Jocassee Valley of southern Appalachia. Rash is another author in the drowned town subgenre who, like Warren, Dickey, and Canadian authors Anne Michaels and Johanna Skibsrud (below), is also a poet, and in 2002 he also released a book of poetry on the flooding of the Jocassee Valley titled *Raising the Dead*. *One Foot in Eden* integrates a murder mystery, a flood drama, and a

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shifting narrative perspective to produce an exceptional piece of southern gothic fiction that utilizes the foreboding and fatalism of a place soon to be flooded to enhance the genre's existing elements of the supernatural, poverty and despair, and the grotesque. When local scourge Holland Winchester disappears (a slight echo of Kenneth Rattner's death in *The Orchard Keeper*), sheriff Will Alexander arrives to solve the case before the valley is flooded and the missing body may be lost forever (an echo of *Deliverance*). The chief suspect is farmer Billy Holcombe, whose wife Amy had an affair with Holland after the local soothsayer, Widow Glendower, told Amy to seek a man who could give her a child because Billy is sterile. The flooding of the valley is effectively a device to frame a gothic piece of detective fiction.

The frequent absence of Indigenous people and African Americans from Appalachian gothic[209] becomes in *One Foot in Eden* part of a meditation on the fragility of human societies and the abiding human memory:

> I thought of how the descendants of settlers from Scotland and Wales and Ireland and England—people poor and desperate enough to risk their lives to take that land, as the Cherokees had once taken it from other tribes—would soon vanish from Jocassee as well. Fifteen years, twenty at most, and it'll be all water, at least that was what the people who would know told me. Reservoir, reservation, the two words sounded so alike. In a dictionary they would be on the same page.
>
> There was a kind of justice in what would happen. But this time the disappearance would be total.[210]

On the one hand, Alexander sees human settlements in south Appalachia as almost inherently impermanent, and their ephemeral histories are about to be washed away; on the other hand, the juxtaposition of *reservoir* and *reservation*, and a recognition that there was a "kind of justice" in the coming flood, suggests that he does not equate the flood with a nihilism that deletes all ethical judgment. Both reservoir and reservation are forms of colonial territorialization, but the sheriff is performing an ideologically unsound equivalence here: the original inhabitants of this land did not have to commit genocide against an existing population, unlike the white settler population. The reservoir displaces a poor white settler population from southern Appalachia, an act of classist aggression that primarily benefits urban white bourgeois populations, but the reservations contain an intersecting violence of colonialism, capitalism, racism, statism, and classism that expropriated land from an Indigenous population. These two

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historical types of territorialization contain dramatically different material and temporal contours, despite their etymological similarity.

Flood fatalism announces and compounds the gothic setting for this novel, as the sheriff arrives in Jocassee: "Darkness pressed against the car windows, deep and silent, and I couldn't help but think I was seeing into the future when much of this land would be buried deep underwater."[211] Like many of the other drowned town fictions, especially those set in the mountains, the transition from blacktop to dilapidated mountain road marks the liminal space of transition from bourgeois modern to gothic impoverishment: "Like almost everything else up here, the road was little different than it had been in the 1860s. But change was coming, a change big enough to swallow this whole valley."[212] The Cherokee name Jocassee means "valley of the lost," for "a princess named Jocassee had once drowned herself there and her body had never been found."[213] Similar to McCarthy's *The Orchard Keeper*, *One Foot in Eden* situates the flooding of the valley as something more than the arrival of modernity: the floods perform an ancient ritual of burial in a land where historical markers disappear or are forgotten. Jocassee is lost historiographically and cosmologically. At the end of *One Foot in Eden*, the sheriff's deputy departs without the murder victim's body: "I drove out of Jocassee, for the last time if I had any say in the matter. I wouldn't be coming back here to fish or water ski or swim or anything else like that. This wasn't no place for people who had a home. This was a place for the lost."[214]

One Foot in Eden hints at a generational divide in the local response to the forthcoming flood. In the era of the TVA, the young understand the inevitability of Jocassee being flooded. Amy's son Isaac carries no pretense of making a life for himself in the valley: "I'd grown up knowing there was no future here, that Jocassee would sooner or later be covered in water, so I'd never let myself get attached to it the way Momma and Daddy had."[215] Isaac encounters an engineer named Sherman Jameson, who tells him that evacuation of the valley has been moved up a day because "some old woman getting evicted set herself on fire"[216] and this was bad publicity for the power company. Isaac protests, and Jameson directs Isaac's attention to the dam:

> "But none of that matters anymore. It doesn't matter how many Indian mounds are here or what flowers or bugs or birds. If you found chunks of gold big as baseballs it wouldn't matter now. That dam's built, and the gates are closed. It

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> doesn't matter if you're living or dead. You don't belong here anymore. Every last one of you hillbillies is going to be flushed out of this valley like shit down a commode."[217]

Isaac wants the truth about his past, his father, and the events that shaped the people of the valley to be revealed, but his mother wants everything to be flooded, "the good and the bad."[218] Similarly, sheriff Alexander wants his troubled past to be buried; he dreams of "water deep as time."[219] By telling the story from different perspectives, Rash shows how individual attitudes about the coming flood in this story are not based on grand narratives of human progress or a nostalgia for an agrarian existence but on individual regrets, desires, and ambitions, micropolitical inclinations and not broad macropolitical stratagems. Alexander welcomes the approaching erasure, in a spirit commensurate with his own acute personal disappointments and estranged family:

> I hoped I would be in that grave before they built the reservoir so when the water rose it would rise over me and Daddy and Momma and over Old Ian Alexander and his wife Mary and over the lost body of the princess named Jocassee and the Cherokee mounds and the trails De Soto and Bartram and Michaux had followed and the meadows and streams and forests they had described and all would be forgotten as if we and Jocassee had never been.[220]

His sentiment evokes an often understated or misunderstood quality of infrastructural violence: the way in which an object of such immensity can generate egocentric affect. Instead of expanding his empathy for those being displaced by the flood, Alexander envisions an antinatalist obliteration of his history and the history of everyone and everything he knows.

Sugaree Rising

Oakland author J. Douglas Allen-Taylor went to South Carolina in the 1960s and spent two decades working in the African American freedom movement. His 2012 novel *Sugaree Rising* is inspired by the expulsion of African communities from the state's Lowcountry for the construction of the Santee Cooper Project from 1930 to 1941, a New Deal undertaking of dams and power plants that created two lakes. Allen-Taylor incorporates into his drowned town novel a fictionalization of the community affected by the Santee Cooper displacement, the Gullah, descendants of African slaves; in the novel, they are known as the Yay'saw.

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> The Yay'saw lived out their lives in the bosom of the water'loa, in bog-filled bottomlands between two rivers and a swamp amidst myriad rivers and creeks and lakes and pools, with two full rainy seasons a year and sudden, swift cloudbursts or heavy thunderstorms or all day downpours the rest of the time, and where the normal irrigation of the family's main crop was complete inundation of the fields several times between planting and harvest. In Yally's lifetime alone she had twice seen the Sugaree overflow its banks, though never as far up as the road, and more times than she could count, the Bigyard transformed into a low pond. Everybody had a favorite flood story, and most more than one. In such an environment, serious flood-talk was no joking matter. On the other hand, the idea of a flood in the abstract was no great cause for concern.[221]

There are many familiar elements in *Sugaree Rising*: the belligerent (and racist) power company forcing an evacuation of the local community; local resistance to the hydrological assemblage; a local history rooted in a centuries-old genealogy; supernatural elements of southern gothic; and so on. But *Sugaree Rising* is the only drowned town novel to foreground the racialization of hydrological space. The approaching flood that will displace the Yay'saw is known to the Yay'saw as "the whitefolks' flood,"[222] and at first the Yay'saw are skeptical of the rumors. The community of Yelesaw Neck remains far removed from the machinations of state governance, so notice of the dam arrives as whispers to a segregated ear:

> The whitefolks were making plans to put a dam across the Sugaree River somewhere just above Cashville, the closest town to Yelesaw Neck. The dam—if what Bonk Jackson had heard could be believed—would leave a deep lake in the bottomlands basin from Cashville all the way north to the county seat at St. Paul and between the town of Sandy Station to the west and the Swamp to the east—the rivers and creeks, hundreds of homes, thousands of farmland acres, a wide collection of villages including the little junction of Jaeger's Cross just over the Sugaree from Yelesaw, the bulk of the Swamp, as well as Yelesaw itself. . . . The enormity of it was too much for Yally to take in.[223]

The rumors of dam construction are dismissed by many locals because they "had been hearing talk of river-damming or creek-diversion or canal-digging or some other sort of whitefolks' watercoming most of their lives, none of which had ended with any more water than you could drink out of a tin cup."[224] Still others believed the rumors of a flood for a hydroelectric project were "nothing but a old whitefolk' trick, trying to bumbooloo peoples offen they land."[225] Unlike in earlier drowned town novels, in *Sugaree Rising* every aspect of the coming flood is understood from the

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perspective of descendants of African slaves. Some of the disbelief over the rumors of flooding derives from the understanding that the state is a racist institution with an extensive history of murderous violence against African communities, and therefore would not endanger the property of white folks. Yally's big sister Eshy provides the rationale for ignoring the rumors of a flood:

> "Lam'jackson say they been talking about—what?—flooding all the Basinbottom. You know how many whitefolk live out through there, how many farms and all? Iffen it been nothing but niggers out in the Basin or they been talking'bout onliest the Neck—" here she paused and sucked her teeth again "—shit, they'd flush all the Basinbottom nigger out in a hot minute, and wouldn't add a mourning tear to the water, and iffen it been just Yay'saw, them'd'a throw them a Four-to-the-July barbecue-and-holler party for celebrate getting rid'a we. But all them buckra, all they cousin and auntie and such? Them sure-enough ain't fixing to do that to they own, and you knows that. Grandpa right. Ain't no water coming."[226]

The community is finally convinced that the rumors of a flood are true, after witnessing a mysterious man interrupt Sister Orry's funeral and admonish the parishioners, "They's a water coming, ain't you know? . . . Water fixing to battle with Earth, and Water gon' win, and cover all the land."[227] Later, Sister Orry's open grave would be flooded by a rainstorm. Speculation surrounds the stranger at the funeral: Was he a "prophesier," a "wudu, possessed of the power to call on such natural forces as wind and water and move them at his direction in the furtherance of his agenda," or just someone who said what others were thinking?[228] The community at Yelesaw forms an opinion of the state's agenda to flood the river basin based on local knowledge, a distrust of white institutions, and an intimate understanding of the region's history:

> In the wake of his departure, considering both the storm and his words and then the disruption of Orry's burial, the belief began to rise again among many that had previously doubted that maybe, after all, there might be something to all of this talk about the Watercoming and the whitefolks' plans to flood the Basinbottom, the Swamp, and Yelesaw Neck.[229]

Modernity descends asymmetrically and irrationally, and its subjects can never be fully aware of modernity's breadth and ramifications. For the people on Sugaree River, construction details and evacuation dates "had been decided upon, not by anyone local, but by whitefolk at the highest levels up in Washington, in close consultation with the governor and members of

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the legislature and, like the dam itself would eventually be, those decisions had been hard-cast in stone and set down so deep as to be unmovable."[230] A white company man who comes to be known by the locals as the "Sparman" because of the SPAR patch on his uniform, an acronym for Sugaree Power and Recreation Authority, tries to convince the Yay'saw to leave and posts handbills announcing construction of the dam. The Sparman embodies the racist order on which this infrastructure operates. He is enraged that "the coloreds over here [across Sugaree River from the 'white' side] had obviously come to believe that they could do whatever they wanted in this isolated little spit of land, and could ignore a white man's word with impunity. He wanted the handbills to serve as notice that regardless of how much they had resisted in the past, those days of resistance were done."[231] The racial order in the Lowcountry has deep historical roots, and the Yay'saw know that the power company is not the only source of potential violence should they resist the construction of the dam; state officials and law enforcement "all had a personal, political stake in this," and "there were white people in Cantrell County who were looking for any excuse to turn the bulldozers loose on this side of the river and knock over a few houses, and maybe knock in a few heads as well." The humanity of African Americans has never mattered to the American project, except as a form of labor power,[232] but *Sugaree Rising* manages to render African American humanity using generic elements of southern gothic and the history of infrastructure development in South Carolina. The novel restores humanity where none was historically allowed by capitalism or the state. *Sugaree Rising* does not offer a victory of resistance to infrastructural violence; the Yay'saw are forced to leave the Sugaree River basin, but a tortured past is given voice in the novel and by the novel. In the events of the novel, a young girl named Yally'Bay Kinlaw almost drowns in Gaya Pond, a fabled place near the swamps of Cantrell County, "a grim, gray-green kingdom where haunts and devils roamed, a shadow-land of death and the dead that could only be dimly perceived at the soft edge of consciousness, and never in the full light of lamp or day."[233] It is at Gaya Pond that Yally'Bay hears the voices of the ancestors:

> A chorus of watery human voices moaning their pain from out of the mud below the pondwater, hollowed and echoing, as if coming up from out of the depths of some great pit, crying out, as if they had waited for many years for just this moment for someone to step out into the water and hear their sorrow-song,

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> voices drawing her down into the earth itself down deep below the pondwaters. . . . Down there she could see their faces, the eyes rolled up white in their sockets, and around their heads was the streaming of tears, and the flowing of blood, that formed the deep and unseen rivers that were the dark source of all the waters of all the world.[234]

The agony of the ancestors, full of tears and blood, manifests the pain of historical transgressions vast and brutal; history might drown these voices under dams and reservoirs, but they can live through literature such as *Sugaree Rising*. The novel does not seek to rewrite history; instead, it constructs a fictional intersection of historicity and genre fiction, making visible the structural racism of infrastructure.

The TVA participated in the construction of landscapes that "reinforced white supremacy and maintained the wide chasm between the races,"[235] a spatialization of racism often overlooked by scholars in infrastructure studies. Black farmers under the TVA, for example, suffered disproportionately from land dispossession, while white farmers increased in number.[236] To avoid conflicts with southern white capitalists and politicians, the TVA "carefully adhered to the valley practices of racial segregation in schools and communities, and restricted economic opportunities for blacks."[237] Arthur Morgan, the engineer who was the first chairman of the TVA, is often hailed as a talented technocrat and a utopian influenced by Edward Bellamy's best-selling socialist novel *Looking Backward*; however, Morgan was also a charter member of the American Eugenics Society while he chaired the TVA, and he once wrote, "the extreme and universal immorality of the negro is a bigger blight upon the country than people realize."[238] Morgan's racism was part of a mesh of historical and material structures that enabled the TVA to make concrete and durable the racist proclivities of capitalism and the state form. As an example of this durability, Nick Estes explains how the history of the midcentury Pick-Sloan Plan, mentioned earlier in this chapter, informed the early twenty-first-century conflict over the Dakota Access Pipeline. Generations of Indigenous communities were flooded along the Missouri River Basin, in what Estes calls "a twentieth-century Indigenous apocalypse,"[239] a dispossession of an entirely different character from those of the settlers because of the intimacies Indigenous people shared with the land and water. Estes explains, of the dispossession: "Unlike white farmers and landowners, who could easily reproduce their businesses and lifestyles elsewhere, Indigenous peoples and the favorable river environment upon

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which they depended could not be replaced."[240] The 1944 Flood Control Act put significant limitations on the ways in which Indigenous communities could coexist with water following their dispossession, and so, in addition to depriving Indigenous people of access to land and water that have since been flooded, the colonial governments of the United States also determined that Indigenous uses of water had to be for "civilized" reasons: "The result is that Indigenous nations can only use a restricted amount—in some instances, a fraction of a percentage—of the water flowing through their territory."[241] For Indigenous people, the large dams that proliferated under the TVA were not miracles of modernization—for most of the benefits of hydroelectricity went to settler communities—but rather were embodiments of settler colonialism, as Estes writes, "their concrete and rolled earth endowed with the will to disrupt, flood, dispossess, remove, and ultimately eliminate Native society."[242] Infrastructure megaprojects such as large dams "work to normalize the racial identities of places and people, communicating powerful messages about who belongs where (or if they belong at all) within the engineered socio-spatial order,"[243] but art such as literature can make visible the sociospatial order in combinations of micropolitical and macropolitical valences often ignored or misperceived.

The Drowned Towns of Canadian Literature

Only China and Brazil produce more hydroelectricity annually than Canada, which derives about 60 percent of its electricity from hydropower, and yet Canadian literature until recently had very few novels that explicitly addressed the drowned town phenomenon. Much of Canada's national(ist) identity is aligned with engineering megastructures, from the transcontinental railway to the Trans-Canada Highway to the James Bay Hydroelectric Project. From 2011 to 2026, an estimated $55 to $70 billion in new hydroelectric projects will be constructed in Canada.[244] Most of this electricity will flow to the United States, similar to the export of bitumen from northern Alberta. With a predicted 30 percent rise in electricity demand in the US over the next 20 years, Canadian hydro will have no shortage of buyers. Perhaps not surprisingly, then, the past decade witnessed a proliferation of Canadian drowned town fiction. Unlike the drowned town literature from the United States, Canadian drowned town novels are not circumscribed by an institutional entity such as the TVA or a geographical location such

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as the South (with its southern gothic genre elements). Canadian drowned town literature participates in the erasure of Indigeneity, but also features the only drowned town novel written by an Indigenous author, Thomas King's *Green Grass, Running Water*. The materiality of memory is another common theme in Canadian drowned town literature, the examples of which begin appearing in the 1990s, much later than US drowned town stories. I have arranged the analyses of Canadian narratives thematically instead of chronologically, in part because of the relatively late arrival of the subgenre in Canadian literature.

The Town That Drowned

Riel Nason's *The Town That Drowned*, which won the 2012 Commonwealth Book Prize and a host of other awards, can be situated in a tradition of Anglo-Canadian liberal nationalism typical of such renowned Canadian novels as *Anne of Green Gables*, which also features the story of a young girl from Atlantic Canada in a coming-of-age fable with nationalist overtones. *The Town That Drowned* is a story of a town discovering that it will be flooded for a major hydroelectric dam project, based on the actual construction of the Mactaquac Dam in the province of New Brunswick; coincidentally, in 2015 the province began consulting the people of New Brunswick on whether to replace, refurbish, or remove the Mactaquac Dam, which is deteriorating and must be addressed by 2030 with one of these options.[245] Because the narrator is 14-year-old Ruby Carson, and the tone of the narration approaches the naïveté, sense of discovery, and veiled recall of adolescent memory familiar to young adult fiction (the first line in the novel is, "The beginning I remember is this: my brother Percy on the old Hawkshaw Bridge"),[246] *The Town That Drowned* manages to narrate a substantial displacement of people by an infrastructure project, which includes the suicide of a senior not willing to be displaced, with a narrative inflection characteristic of less dramatic material. "What does the arrival of modernity look like to a teenager?" is another way to frame this novel's narrative strategy. How do the typical concerns of infrastructuralism interact with the generic conventions of young adult fiction?

For the first three chapters of the novel, the only signs of the dam are surveyors' stakes discovered by Ruby's mother while out for a walk. For a short time, the stakes provide the townspeople with objects for gossip. The dam is situated as something beyond the understanding of the locals, parallel in

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ways to Ruby's own limited comprehension of the world she inhabits. At the same time, the town is considering reconstruction of the Hawkshaw Bridge, a piece of infrastructure that is "falling down"[247] but notable in the lives of Ruby and Percy because this is where Percy (a nine-year-old who might be autistic) ritualistically drops into the river bottles containing meticulous but impersonal messages. The place of infrastructure in this world of young adults is articulated by Ruby, referring to her brother: "Not too many of the under-ten crowd, or even the under-eighteen crowd for that matter, sit around talking about transportation infrastructure issues."[248] Even though one of those "infrastructure issues" is about to change their lives, the subject itself remains beyond the imaginative parameters of young adults. Notably, Percy—whom others in the story see as "a bossy, spoiled little boy"—is deeply affected by "the smallest of changes, like a drop of orange pop on his white T-shirt."[249] Percy spends years dropping messages into the river from the Hawkshaw Bridge, recording every bottle drop and its weather conditions, and calculating the trajectories of the bottles on a map of New Brunswick and a globe. In Rason's central adolescent characters are contrasting types (a hypersensitive child-savant who resists change, a teenage observer/narrator witnessing the changes around her, such as the departure of her best friend to a nearby city), and the contrasts prepare the reader for the arrival of the dam as either a terrifying transformation or some kind of pedantic lesson about change. It is Ruby's father, a government bureaucrat, who finally discloses the meaning of the surveyors' stakes:

> The facts are these: there isn't going to be a new bridge. The surveyors and the stakes they left behind are for a project much larger. A dam is being put across the river at Mactaquac, about fifteen miles from here. It's going to be of a size and a cost that's hardly imaginable. The dam will be a hydroelectric plant constructed to produce energy for the province. The water on our side of the dam will be backed up, causing flooding. It won't be like a spring flood; it will be permanent. The river is predicted to almost double in width. Land we can now walk on will go underwater.[250]

Ruby's mother "cries quietly." Other relatives in the room comfort each other. Percy asks Ruby, "Do you think my bottles would become permanently damaged passing through a hydroelectric dam?" Ruby sees the development from a stereotypical teenager's perspective: "A government-funded chance to move? Yes, please. Sign us up."[251]

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The construction of the dam in *The Town That Drowned* coincides with noted events in Canadian history, which not only makes explicit the way in which large infrastructure projects are often discursively solidified with nationalist rhetoric, but also structures this particular narrative on a parallel between the micro- and macropolitical. In the most pedestrian sense, Ruby and Canada are coming of age in 1965. The personal and political transformations are represented by Ruby's adolescent struggles, the shifting material form of the province, and the new symbol and engineering megaproject of the nation-state. The premier of New Brunswick celebrates the new dam project with a parade of now-common clichés: "It's a time of bold change, a look to the future of our province, a brave sacrifice by some for the benefit of the many. . . . It will make New Brunswick strong, the premier says, harnessing this powerful water resource. It is an opportunity to move forward, this new energy."[252] But Ruby's father asks, "How can the politicians see our homes, this space we live and breathe in, only as squares on a map on a table in a big fancy conference room?"[253] Perhaps because the novel is written in the genre of young adult fiction, antagonism toward the new dam rarely finds more strident expression than this. In the same year of 1965, the so-called Great Canadian Flag Debate was playing out on TV. This was the year in which the red maple leaf became the official flag of Canada, a change that Percy notices with his characteristic sensitivity.[254] Also arriving with the flooding of Ruby and Percy's town and the construction of a hydroelectric dam is a "new pulp-and-paper mill" and "the new Trans-Canada Highway being built on the other side of the river."[255] The Trans-Canada Highway began construction in 1950; currently, it stretches over 7,800 kilometers from the Pacific Ocean to the Atlantic. Toward the end of the novel, Ruby observes the new community created for the people displaced from her town; she sees "dozens of lights in a grid surrounded by darkness" from the vantage of "driving along the new Trans-Canada Highway on the other side of the river," and the sight of the "pre-fab houses" that "all look the same" leads Ruby to declare the new location "[our] own modern ghost town."[256] As if to punctuate the sterility and sense of desolation in the new development, Rason also notes ironically that there is "a new historical village being assembled as the province's centennial project," a "tourist attraction located downriver not far from the dam," and some of the houses in this tourist attraction will include "those rescued from the flooding." These houses will be "restored to look like they did

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when they were first built."[257] The tourist attraction is part of a celebration of Canada's centennial year in 1967, which includes a brochure with suggestions for "embracing [our] heritage" and "remembering and memorializing [our] local history."[258] The dam construction therefore coincides with a wave of nationalist nostalgia, and the erasure of local landscapes coincides with the construction of wistful tourist monuments erected from the ruins of the drowned town. Canada, New Brunswick, and Ruby Carson are being encouraged simultaneously to embrace the promise of modernity and to anchor subjectivity to a past that never was.

The existential crisis of being caught between an imagined past and a future built on distant power is nicely articulated by Ruby's father, who tells her that "this is what it feels like to know your whole life is someone else's calculation, your family a number in a list on a page."[259] The dam arrives with the emergence of the neoliberal era and the rapid expansion of global capitalism, and both developments interpellate subjects with the anxiety and fear of being ruled from afar. Ruby's stereotypical teenage anxiety is accompanied by this greater structural anxiety, the arrival of the infrastructure society and its remote silent running. She describes her life at one point as "one big miscalculation," a typical form of adolescent anxiety expressed in the instrumentalist language of computation. Ruby eventually explicitly attaches her existential dread to the arrival of the dam: "Nothing around here goes the way it's supposed to. It's the taint, the darkness, that came with word of the flooding. We're living on borrowed time, in borrowed space. Our whole existence now is a freak of nature."[260] The impending flood transforms Ruby's entire worldview, but it does not attune her to the fact that her family and entire town are an extension of the white settler legacy. In fact, the novel has nothing to say about the obvious historical parallel of forced displacement. Instead, Ruby's rambling revelation in the latter part of the novel reveals her own sense of an unabashed belonging to settler society:

> If ever you wake one day and the people who run your little province tell you they're going to drown the valley you lived your whole life in, the valley your parents were born in, *the valley your ancestors thought was as good as a gift from God* when they sailed to this New World and *were given a piece of it* to start their lives over again (and that's why it's called God's country), if men who live in a city of planted elms on squares as big as half your front lawn, and work in buildings from which they should be able to see the same river as you (but somehow you

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> just know they don't ever see it the same way), if those men decide for you that a tidal wave is coming to wash your whole life away—well then know that there will be at least one, maybe some, who will love that beautiful land so much they won't ever want to see it different, won't ever have it turned into only a memory, and would rather become one with it than let it go.[261]

The added historical distortion of suggesting that settlers were "given a piece" of what is now called Canada, thereby erasing settler violence, might be an expression of Ruby's naïveté, but it definitely situates the novel's depiction of infrastructure in terms of liberal nationalism instead of a more radical perspective. Ruby's sense of solidarity is based on a view of the river about to be dammed. At the beginning of the novel, she emphasizes that "a view of the water" is the "main event" in Haventon.[262] In her "God's country" diatribe, she wonders how urban bureaucrats who "should be able to see the same river as [you]" could possibly decide to flood Haventon. The novel ends with her contemplating her new relation to the river: "It's so big compared to before, but from this view, with our house way up there now, it seems smaller, left in the distance."[263] The river, perhaps the central counterpoint to the distant power of infrastructure, is supposed to be the landscape feature that unites the citizens of Haventon, but other structural forces are now more powerful than "a view of the water," at least in the simplified worldview of Ruby. Her politics are almost entirely aesthetic.

Being displaced by the dam has thrown Ruby and the others into an unfamiliar material framework for living their lives. She finds the idea of "ghosts," of something haunting a fixed location, easier to "think about" than the idea that her childhood home will soon be flooded: "this space I am filling, the air I am breathing, will soon be out of reach to anyone alive. It will be deep in the river. Every invisible dot in front of me now, contained in these walls called my room, will be drowned and gone."[264] Infrastructure—often figured as apolitical, invisible, pure technicity—is here the impetus for existential wandering, a deeply alienated sense of being, a displaced subjectivity so seemingly at the whim of distant power that it finds ghosts more intellectually palatable than the immanent flood. The existential crisis depicted in *The Town That Drowned* is familiar terrain, in the sense that the anxiety of adolescence is a generic part of coming-of-age stories, but it is also materially specific to the midcentury proliferation of large dam construction. Clearly, for Ruby, "time is out of joint," a kind of Derridean hauntology is at work, as the arrival of the dam produces her

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recognition of an absent present, or a spectral past and a distant and ontologically foreign present.

As the town of Haventon prepares to relocate, the inhabitants engage in forms of nostalgia, from a farewell dance at the local school to private commemorations of houses that cannot be moved and therefore must be burned *in situ*. Ruby acknowledges in this context "an unusually high tolerance for nostalgia and sentimentality."[265] Into the absent present created by infrastructure construction, the townspeople flirt with forms of denial and a kind of suspended animation. "Although it may be easy to temporarily let yourself forget a dam is being built," Ruby remarks, "since it's fifteen miles downriver, no one can pretend nothing's happening here."[266]

Progress

Michael V. Smith's *Progress*, published in the same year as *The Town That Drowned*, also foregrounds the construction of a hydroelectric dam. Where Nason's novel uses a major infrastructure project as a foil for the micropolitics of the *Bildungsroman*, *Progress* contrasts social progress, in the form of a family grappling with its history of homophobia, with the question of technological progress embedded in a large dam that will displace the remaining family members and everyone else in the town. The novel opens with Helen Massey witnessing the accidental death of a worker who falls "like a sack, straight down" from the dam, then disappears "behind the concrete."[267] Workers dying during the construction of infrastructure such as large dams is surprisingly rare in drowned town fiction (a son dies this way in *Dunbar's Cove*), especially given the deadly history of major infrastructure projects. On the same day as the accident, Helen's brother Robert returns 15 years after a conflict with his father over Robert's sexuality. The melodramatic elements of *Progress*—which include the revelation that Helen's long-deceased teenage lover, Garrett, was also at one point involved with Robert—are fairly unremarkable but transform into a promising premise through the juxtaposition of the drowned town narrative. *Progress* explores multiple concomitant forms of progress: technological, social, perhaps even ontological. Smith signals his intention to examine "the content of progress" with an epigraph from the English artist and critic John Berger: "The twentieth-century struggle between capitalism and socialism is, at an ideological level, a fight about the content of progress." While Smith has little to say in the novel about the struggle between "capitalism and

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socialism," his book does contribute to what Brian Larkin calls the "range of visibilities" produced by infrastructure.[268]

When we first meet Helen, she is still living in her deceased parents' home in a small town. Unlike Robert, her psychological habitation is her past. The sight of the accident in the opening scene proves traumatic, much in the way the construction of the dam in *The Town That Drowned* compels Ruby to alter her worldview, at least temporarily. The "freak occurrence" of the man falling from the dam leaves Helen "trapped in a loop of imaginings where the world offered up accidents, a repertoire of tragic coincidences."[269] Driving away from the accident, she sees "nothing before her but a random menace," and "behind everything there was darkness, behind every colour, void."[270] Typical of this novel, Helen's trauma does not lead to reflection on the sacrifices of working people in the construction of infrastructure (despite the suggestion in the novel's epigraph that this will be a book about capitalism versus socialism). Instead, Helen's witnessing of the accident becomes an existential trauma that reinforces her loneliness; she is "cleaved from the world."[271] The infrastructure around her signals her return to conscious behavior, once the darkness of her trauma has passed:

> Things in the landscape—pavement, road sign, fields of grass, trees, river—were just that: objects, things, unconnected blobs of things. The steering wheel seemed to become itself, a *steering wheel* in her grip. Her hands were *hands*. She was gripping the wheel; she could *feel*. She felt like a person again.[272]

The apolitical quality of infrastructure, in this passage, represents a phenomenological familiarity: when infrastructure is just an "unconnected" mass of "things," everything is as it should be. Awareness of the constructed nature of infrastructure—the shock of an accident while building the "astounding" dam, "something so mammoth,"[273] like "a giant's knuckles"[274]—occurs as an act of witnessing; a dead man becomes "a ghost of her imagination," repeatedly "falling through the air . . . inside her, like a fishing line tied to her heart."[275] The accidental death is not reported, and construction of the dam continues. Helen does not trust her own witnessing of the event; instead, she wants a "news report, to lay out a few neat quotes on [the Power Authority's] regret, to claim responsibility for a safer workplace in the future, assure people that it would not happen again, name the horrible loss, speak it into the world so that it exists, the man existed."[276] In the absence of an official record of the man's death,

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Helen wonders, "What kind of future were we building if we didn't name our mistakes, or our dead?"[277] Her anguish over the intrusion of infrastructure does not name worker exploitation, environmental degradation, or the displacement of an entire town as her central concern; rather, she wants official recognition of events. This is a tepid anxiety in the context of epic and violent transformations.

Helen understands "there was leverage in what she knew, power in what she'd witnessed," because the Power Authority invites her to a meeting in an attempt to blackmail her into accepting its terms for displacement.[278] Instead of dreaming of a radical action to stop construction of the dam, preserve her home, and have the Power Authority acknowledge the man's accidental death, Helen simply imagines she will demand that the company "acknowledge his death, print an obituary, hold a memorial, do him justice."[279] All of this is rather disappointing for a novel that prefaces its story with an epigraph about capitalism and socialism. When she confronts the company man, Cruikshank, she tells him "some things are more important than money," and even she realizes "the phrase felt too slight to bear the importance of what she meant."[280]

Helen's brother Robert returns after a lengthy absence to see the family home before the land is flooded. Robert and Helen's parents had never revealed the reason he fled as a teenager, so much of the novel involves a belated confession and sibling resolution. Much like the nostalgia provoked by displacement in *The Town That Drowned* and the American literature discussed above, Robert's return in *Progress* also produces reflection on the passage of time:

> Everything different was something of a relief, a great relief, that things had moved on, that this wasn't the same place that he'd left. The differences held promise, and knowing that he'd missed that evolution, that he'd not been privy to the changes, or an influence on them, that what had changed here did so without him, made him feel cheated, nostalgic for the progress he'd missed.[281]

Progress here is a local but historical phenomenon; that is, there are different temporal and spatial scales of progress in the novel. Robert's birthplace has been transformed in his absence. Helen refers to the natural changes in the landscape around her home as "this other progress," which "she in her lifetime could not stop."[282] Instead of the new dam marking the arrival of modernity in some kind of holistic way in which *everything changes*, the dam is perceived in a radically subjective manner: Robert does not notice

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the dam, even as he, Helen, and others dig up a grave across the river from the dam "lit up bright as day," in a last attempt to undermine the Power Authority.[283] In the final sentences of the novel, the world is indifferent to Robert and Helen's attempt to spite the company behind the dam: "Robert looked around them, then up to the sky, wishing for something to prove what they had done was right, but everything was the same. The sky was the same. That had to be good enough."[284]

What makes an otherwise routine observation about the phenomenology of infrastructure—that it can be transformative and banal, seemingly ubiquitous and functionally invisible, depending on one's point of view—more provocative is the juxtaposition of elements in what Ara Wilson calls "the infrastructure of intimacy."[285] The parallel stories in *Progress*—the drama surrounding the construction of the dam, and the revelations about Robert's sexuality and subsequent sibling reconciliation—might be reduced to parallel forms of progress, technical and social. In addition to these manifestations of the myth of progress, however, the novel makes conceptual connections between infrastructure and intimacy, conventionally defined as ontologically opposed. Large infrastructure normally produces forms of distant power, such as the kind of anonymous "calculations" determining Ruby Carson's life, but in *Progress* the construction of a dam becomes the catalyst for a family reunion and reconciliation. The point is not that dams are inherently intimate assemblages, but that the forms of intimacy associated with infrastructure are not always obvious or predictable. The narrative structure of *Progress* invites readers to see infrastructure and intimacy as inextricable, rather than as mutually exclusive public and private domains.

When Is a Man

Infrastructure in the form of a large dam is once again thematically paired with intimacy in Aaron Shephard's 2014 novel *When Is a Man*. Paul Rasmussen, a 33-year-old recent graduate recovering from prostate cancer, travels to the Basket Creek recreation area near the fictional McCulloch Dam somewhere in the province of British Columbia to spend 40 days alone gathering data about the local fish population. Paul quickly finds himself enmeshed in a decades-old mystery based on the construction of the dam, the displacement of 1,100 people in the dam's path, the bitter disputes over compensation for displacement, and even a murder. Paul's personal anxiety over his struggle with cancer and impotence parallels the tensions within

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the local community. Paul compares his "body's quiet betrayal" with "the babbling menace of the Immitoin [River],"[286] the river named by the Indigenous inhabitants to suggest a "place to hunt and fish, to gather and collect, but not to dwell."[287] The "monolithic concrete wall of the McCulloch Dam"[288] disturbed the ecology of the river and its surroundings, a place where salmon once flourished and settlers once cultivated orchards now drowned by the reservoir. Like the arrival of cancer in Paul's body, the dam produced an existential disruption that Paul describes as "an underlying, old anxiety."[289] *When Is a Man* articulates this anxiety through different discourses: historical documents such as the fictional book *Dixon's Gold*, Paul's ethnographic interviews with locals, his own subjective experiences, and the analysis of his academic advisors. The novel offers a polysemic aggregation of existential anxiety, for which the dam provides the primary material conjunction. Paul's cancer and impotence—his "intimate life"—are embedded in an assemblage of survivor testimonies, documentary histories, subjective experiences, river basin ecology, and the unbounded complexity of the McCulloch Dam apparatus.

Paul's recently completed dissertation about the sport of parkour provides *When Is a Man* with one of its more obvious metaphors: "the way people negotiated obstacles or incorporated them into their routes."[290] While Paul and his academic advisor agree that the history of the McCulloch Dam shares many parallels with dam construction in other parts of the world,[291] *When Is a Man* tries to illustrate the micropolitical variations in these seemingly indistinguishable experiences. Social scientific studies of large dam construction quantify the categories of disruption—mass displacement, ecological spoilage, economic costs and benefits—but literature can aestheticize the idiosyncrasies of where micropolitics and macropolitics converge. *When Is a Man* critiques the limitations of existing, fictional depictions of large dam construction, to serve as a premise for its own literary expression of the micropolitics of large dams. In the novel, Paul expresses this idea in at least two ways. First, he imagines how images of large dams, often considered portraits of the sublime, betray the complexity of large dam assemblages. At one point, he is reading a magazine article about run-of-river dams, dams that produce electricity with little or no storage of water, and he remarks on the "picture of a small powerhouse beside a placid autumn river in New York State, a nineteenth-century milldam resurrected and modernized to supply hydroelectricity to the adjacent

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neighbourhood. The image was quaint. . . . Of course, the reality was more complex."[292] The aesthetics of energy landscapes often betrays or obscures technosocial legacies and individual anxieties over displacement, the subject matter of *When Is a Man*. Paul also considers the paucity of observation because of the commonness of large dam construction in the age of hyperindustrialism: "Outsiders like him could only relate to the valley's flood and people's displacement in the most abstract way, and that was partly because they'd heard this type of story so many times, they'd become desensitized to it."[293] The quantification of the macroplitical course of large dam construction numbs observers to the affective qualities embedded in the numbers. Again, this is where art can provide a corrective.

When Is a Man remains conscious of its engagement with drowned town genre conventions. Shephard allows one of his characters to make the self-aware confession: "The case of the thing beneath the water that makes everyone angry. . . . *Reservoir noir*. . . . Technically a sub-genre. . . . The formula's pretty standard: a reservoir is drained and a body, or some terrible secret, is discovered."[294] Drowned town narratives often perform psychological allegories in obvious ways: what lies beneath the reservoir becomes the return of the repressed, the dark secret everyone knows but refuses to acknowledge and confront. *When Is a Man* tweaks this convention by disturbing the diagnosis. Paul's own anxiety over his cancer and impotence unsettles his otherwise conventional imagination. When he imagines "everything preserved beneath the water—a wrecked paddle-wheeler, the drowned frame of a country house. It was a romantic, compelling vision, something out of a book"[295]—he knows this is a "false image" and wonders whether the displaced people were "harbouring bitterness" or "bewildered and half mad from loss."[296] The tension in his mind is a conflict between the idyllic image that holds sway over his imagination and the fevered questions that occupy the same mental space. Once again, the aesthetic presents itself as a site of contestation for understanding large dam construction and its social and ecological consequences.

Paul is drawn to the mystery of large dam complexities similarly to the way he feels an attraction to the sound of the river, "the rhythms and counter-rhythms, the layers of melodic and discordant voices created by unexplainable surges and shifts among different currents."[297] Inevitably, as in so many other drowned town narratives, the novel asks the larger question about progress: "But wasn't the lost intimacy of their

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community—the growing alienation between neighbours, between people and landscape—the inevitable course of progress, regardless of the flood?"[298] Large dam construction is one assemblage among many, and the intersecting assemblages called progress have taken on the aura of inevitability. Shephard poses a question here that traces the micropolitical (neighbors) through the macropolitical (landscapes, progress). While the novel certainly does not provide a schematic for the deterrence of large dam construction, or an enthusiasm for large dam destruction such as generations of radicals have found in *The Monkey Wrench Gang*, *When Is a Man* ends with an image of currents that evade capture, an image of a horizon or even eternity: "They would go, ascending, until the Immitoin fractured into smaller, steeper tributaries and impassable waterfalls, unbraided itself into creeks and rivulets that coursed through the alpine meadows, spilled from small glacial lakes or seeped out of the earth and between stones. To where the river both disappeared and began."[299]

The Sentimentalists

Drowned town narratives are ideal for exploring the concept of memory. As mentioned above, the typical drowned town narrative is about nostalgia or the return of the repressed, an emphasis on what or who has been flooded for the sake of the dam. *The Sentimentalists*, Johanna Skibsrud's winner of the 2010 Giller Prize, Canada's largest annual cash prize for a novel in English, is primarily a novel about the trauma of the Vietnam War reverberating over decades in the life of Napoleon, the narrator's father, especially in his relationship with Henry, the father of Owen, who died in the war. Napoleon and Henry live in Casablanca, Ontario, on the shore of a reservoir that covers a former town. *The Sentimentalists* is a drowned town story about the thingness of memory, the persistence of objects. Timothy Morton describes "a world in which there is no 'away,'"[300] in which the naive belief that the waste of capitalist overconsumption would somehow dissipate once out of sight returns to haunt the capitalist subject with suffocating obduracy. The narrator of *The Sentimentalists* reveals, for example, her changing sense of memory, from something that remains buried to something that simply *remains*:

> When I was younger . . . I had imagined that the past really existed, semi-submerged, in Henry's backyard. . . . Now, though, I find it difficult to believe that anything is ever buried in the way that I had once supposed. I believe instead that everything

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> remains. At the very limit; the exact surface of things. So that in the end it is not so much what has been subtracted from a life that really matters, but the distances, instead, between the things that remain.[301]

Instead of the reservoir symbolizing the repression of memories, in the way it typically does, here the narrator shifts the agency of memory from the subject's experience of things being present or absent to the "distances" between "the things that remain," and of course "everything remains." The narrator remembers her father as one who remained a "house carpenter" who saw all "objects . . . in different stages of design or repair."[302] He was a "great rememberer," but "he never remembered anything in the right order, or entirely, and always had just little bits of all the books and poems he'd ever read floating around in his mind."[303] Memory in the novel is inherently flawed; history is partial; but not simply because human beings are victims of contingency.

The drowned town provides the spatial impetus for recognizing memory's "layers," like the objects submerged but present, memory as volume instead of circumference:

> But, as I floated over Henry's old house, and did and did not listen to myself, it occurred to me that the reverse of the thing was also as true. That instead of disappearing—or equally, as we disappeared—we also existed more heavily, in layers. And that by remaining, as in floodwater, always at the surface of everything, though our points of reference begin to slowly change, it is always so slight a transition, moment to moment, that it is almost always imperceptible.[304]

Here, memory is a medium, transversal in trajectory and temporally sedimentary, "always in further combination, like the objects of my grandmother's barn."[305] The metaphor of remaining "always at the surface of everything" resembles the spatiality of the Moebius strip, which "entwines discrete surfaces," as in Deleuze and Guattari's "figure of the subject without fixed identity which is peripherally produced in its traversal of surfaces."[306] A dam is not a self-contained object, an obstacle in a void. Similar to Paul's experience in *When Is a Man*, the narrator of *The Sentimentalists* finds large dam assemblages to be "an embedding environment for intimate life," to use Ara Wilson's language.[307] And like Paul's realization that the quaint images of dams buried in his memory skewed the actual complexities of technosocial assemblages, the narrator in *The Sentimentalists* changes her understanding of nostalgia adopted long ago. She and her family would pretend to be the residents of the former town, play-acting their

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lives, "imagining them preserved down there somehow. As if, like it was a ship, they'd gone down with it, and existed there still."[308] But she discovers that "the simple arithmetic of things . . . was not so simple."[309] The linear history of objects preserved and drowned shatters into a diffuse multiplicity, a frangible interdependency.

> And that, by reading backwards along the lives of objects, and the things that I learned piecemeal from my parents, and from the rest of the world, I was only being thrown farther and farther off course, and was by now very far from the straight and deep waters for which I had always felt I was somehow bound.[310]

Everything remains, but not everything continues to signify in a coherent and linear chain. The narrator relives "the lives of objects," but does not find answers in the way so many *reservoir noir* novels do. *The Sentimentalists* might more accurately be called *reservoir memoir*. Even emotions are objectified in the search for what lies beneath: "My own sadness seemed, at those times, to draw itself in—a complete and separate object—so that it seemed to have nothing to do with me anymore."[311] And the "straight and deep waters" of the reservoir are not only the medium of memory, they are also the ontology of stories themselves, as the narrator describes "her own, separate, antediluvian underworld, which was what (influenced, I suppose, by the buried town of Henry's backyard) we imagined all stories to be."[312]

The Winter Vault

Anne Michaels's 2009 novel *The Winter Vault* shares many similarities with *The Sentimentalists*, even though the stories they tell are dramatically different: like Johanna Skibsrud, Michaels is a poet-turned-novelist (a popular combination in drowned town fiction), and the narrative style in both novels is decidedly lyrical; both novels employ the drowned town subgenre for a meditation on memory; and both novels are concerned with materiality and memory, memory that resides in the distribution of objects and the granularity of the body. *The Winter Vault* tells the story of Avery and Jean Escher, a Canadian engineer and a botanist, respectively, who meet on the banks of the St. Lawrence River during the construction of the seaway, an assembly of locks and canals built in the 1950s to connect the Great Lakes with the Atlantic Ocean. A decade later, they are on a houseboat on the Nile River for the relocation of a temple about to be flooded by the ascending water of the Aswan Dam. A tragedy separates them, and the novel becomes more staid and contemplative as the two characters pursue separate but

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related facets of dam construction and memory: Avery studies architecture with younger students who do not appreciate that sometimes it is "harder to build nothing";[313] Jean meets a Polish émigré artist named Lucjan, who shares stories of occupied Warsaw during World War II. In both instances, the characters are haunted by the violence of displacement and the impotent attempts to replicate villages and cultures erased by floodwater.[314] The parallel tracks of their lives conjoin large dam construction with the Holocaust, both mechanized erasures of people and cultures, and the individual attempts to negotiate memory with history.

The engineer and the botanist: Avery and Jean are the juxtaposition and separation of the artificial and the organic, destruction and rebirth, erasure and growth. Through these characters, Michaels invites readers to contemplate the similarities between the Nazi genocide and the global construction of dams, canals, locks, and other water infrastructure, the suicidal trajectory of the state form, which begins with genocidal campaigns to erase Indigenous populations and ends in the long shadow of species extinction.[315] Jean remembers what Avery wrote in his "shadow-book from the desert":

> Soon, more than sixty million people will have been dispossessed by the subjugation of water, a number almost comparable to migrations caused by war and occupation. While the altered weight of the watersheds changes the very speed of our rotating earth and the angle of its axis. Unprecedented in history, masses of humanity do not live, nor will they be buried, in the land where they were born. The great migration of the dead. War did this first, thought Jean, and then water.[316]

In Egypt, Avery managed the relocation of the Abu Simbel temples in 1968, part of the construction of the Aswan Dam and Lake Nasser. The project drowned the villages of lower Nubia, flooded islands and rivers, and contributed to a migration of laboring Nubian men to Cairo, Khartoum, and London.[317] A river that had sustained a culture for 5,000 years was diverted and submerged, and Avery's job was to create a simulation of that culture in a new location. "What was personal loss in the face of universal devastation—the loss of Nubia, the destruction of cities,"[318] Jean wonders, articulating a question that haunts almost all drowned town fiction and frames the ineffable experience of infrastructural violence. At what point does the personal suffering, collective displacement, cultural erasure, and material violence of large infrastructure in the name of progress qualify as genocide?

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The figuration of memory in *The Winter Vault* emphasizes, like *The Sentimentalists*, the media of memory, objects as persistent carriers of events and ideas. When Jean visits a desert market in Wadi Halfa, on the Sudanese side of Lake Nasser, she thinks about "the memories she imagined these objects carried, the sadness of things."[319] Similar to Skibsrud's claim that "everything remains," Avery reflects on the absence of his mother and understands the power of lost people and objects: "Everything in this world is what has been left behind," he concludes.[320] The construction of dams makes Avery attentive to forms of erasure. He recalls working with his father, also a hydraulic engineer, and not sharing his father's enthusiasm for rearranging cultures with the stroke of a pen; rather, as he sits with his father, who is examining a map of his projects, Avery "wished [he] could snip the dams away like a stitch in a cloth, bring breath to the choked throat, bring all the water back with a single scrape of an eraser, bring back the houses, the graves, the gardens, the people."[321] His sensitivity to erasure, because of and in spite of his job as an engineer, leads Avery to wax eloquent about the design of despair, the "dead space" between constructs:

> Avery spoke of the despair of space that the built world had created; waste space too narrow for anything but litter, dark walkways from carparks to the street; the endless, dead space of underground garages; the corridors between skyscrapers; the space surrounding industrial rubbish bins and ventilator shafts . . . the space we have imprisoned between what we have built, like seeds of futility, small pockets on the earth where no one is meant to be alive, a pause, an emptiness.[322]

Erasure, dead space, loss: What is the relationship between infrastructure and intimacy, large dams and the disappearance of people and cultures? The addendum to this question: What has replaced the erased, how much of this is just an addition to a planetary gulag under development? The Polish artist Lucjan offers a materialist, antihumanist explanation of loss: "From the bricks of our buildings, from cement to human cells, everything exists because of chemical transformation, and every chemical transformation is accompanied by loss."[323] Lucjan's perspective resembles the flat ontology of Deleuze and Guattari. From "cement to human cells" is a relational commonality deceptively concealed by material differences. The metaphor of "chemical transformation" is also used to describe the flooding of villages for a hydrological project: "When the water came, the houses would dissolve like a bromide."[324] The metaphor helps explain the totality of erasure, similar to the experience illustrated in Warren's *Flood*:

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"But they [the houses] would not even disappear into the river, which held a memory of them. For even the river would be gone."[325] This is a disappearance not even memory can retain, except, arguably, in the form of literature.

Green Grass, Running Water

The only notable work of Canadian literature authored by an Indigenous person and explicitly about the Indigenous encounter with large dams in Canada is *Green Grass, Running Water* (1993) by Thomas King. While only one of the four narratives in the novel is about the construction of a large dam, the novel's interrogation of different storytelling traditions, a postmodern conceit that frames the individual storylines, begins and ends with the story of water. "In the beginning, there was nothing. Just the water,"[326] says the unnamed narrator. Indigenous and colonial metanarratives jostle for control of the novel, which addresses the role of water and flooding in many global creation myths, and "intervenes in and revises narratives that affirm colonial dominance and plot Native American absence."[327] In the framing narrative, the Trickster god Coyote, an unnamed narrator, and a dream called Dog discuss creation mythology, until the narrator explains the escape from a mental health facility of four Native American elders. They are named Lone Ranger, Robinson Crusoe, Ishmael, and Hawkeye. They become narrators of subsequent chapters in the novel. The story that deals most directly with large dam construction as a facet of colonization is the story of Eli Stands Alone, a Blackfoot man who returns from his position as an English professor at the University of Toronto to block the opening of the Grand Baleen Dam. Eli lives in his mother's house on the spillway of the dam, as an act of protest. His legal injunctions prevent the dam, "an immense porcelain wall, white and glistening," from becoming operational.[328] Duplessis International Associates, the construction firm contracted to build the dam, circumvents ecological and cultural damages the dam will cause to traditional Blackfoot territory.[329] To Clifford Sifton, the engineer overseeing construction of the dam on behalf of Duplessis, the dam is simply an apolitical slab of concrete, to which Eli responds with a reminder of where dams in Canada are frequently built:

> "That's the beauty of dams. They don't have personalities, and they don't have politics. They store water, and they create electricity. That's it."

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> "So how come so many of them are built on Indian land?"
> "Only so many places you can build a dam."[330]

The exchange represents the clashing worldviews of Anglo-Canadian capitalism and the First Nations. The Grand Baleen Dam is another example—in this novel, an exemplar—of Indigenous erasure by Anglo-Canadian infrastructure. Infrastructure in this context not only erases Indigenous culture and territory, it does so in an enduring and violent way. The title of the novel reminds readers of the broken promise of the Canadian state, that it would give Indigenous people the rights to their land "as long as the grass is green and the waters run." Eli knows the phrase "didn't mean anything."[331] Indigenous characters in the novel joke about renaming the dam the Grand Goose or the Golden Goose, "because of the promised fortune and because, as Sam Belly put it, that's about all Indians ever got from the government, a goose."[332]

In another exchange between Sifton and Eli, King reveals that the novel's object of critique is not hydroelectricity but the entire European settler worldview that seeks mastery over natural cycles through the industrial striation of water:

> "Dam's a dangerous thing all right."
> "You want to talk dangerous, let's talk coal-burning plants."
> "It's the idea," said Eli.
> "Let's talk nuclear power."
> "It's the idea of a dam that's dangerous."[333]

The "idea of a dam," in the most general sense, is the epistemic violence of colonialism, the ways in which traditional knowledge systems are diminished or destroyed, and the ways in which anticolonial discourses inherit colonial cosmologies and theorists.[334] For Sifton, industrialization is nonnegotiable. Hydroelectricity represents a lesser evil, if coal or nuclear are the other options. For Eli, the "idea of a dam" is "dangerous," a fundamental confrontation with river basins and the ecologies to which they belong. Eli's futile struggle with the apparent inevitability of progress eventually receives a metaphysical *deus ex machina* when Coyote's dancing and singing causes the dam to break. In the subsequent flood, three cars float into view: a Nissan, a Pinto, and a Karmann-Ghia, most likely a reference to the *Niña*, the *Pinta*, and the *Santa María*, the ships that brought Columbus to the Americas. The dam collapsed, "and the water and the cars tumbled over

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the edge of the world."[335] The collapse of the dam initiates an Indigenous rewriting of colonialism. The markers of industrial capitalism disappear "over the edge of the world," the history of Columbus and the genocide he fostered is undone. "Below, in the valley," King writes, "the water rolled on as it had for eternity."[336] The intervention of deities to reverse the colonial narrative might suggest King is pessimistic about the possibility of decolonization, or it might suggest narrative decolonization precedes social decolonization. The idea of the dam must be defeated before the dam itself can be removed.

Major infrastructure such as large dam assemblages constitute a primary example of the quotidian ways in which settler colonialism is prefigured. The drowned town fictions examined above offer several examples of stories of the arrival of hydroelectricity in which Indigeneity is largely or completely absent but "the eruptions of otherwise irrelevant or marginal signs of indigeneity draws attention to the question of how settler colonialism operates when Native people(s) are not in the picture, how it functions as an ordinary mode of framing and experience."[337] For Rifkin, the purpose of examining texts that illustrate settler common sense is "to think through the historical circumstances that cohere settler phenomenology as an anchor for nonnative sense-making and action in the world."[338] Drowned town fiction often depicts the micropolitical intimacies among large dams, settler societies, and the displaced Indigenous populations, but the transversal trajectories of these vectors would be invisible or irrelevant to state planners and the capitalists they serve. Drowned town fictions often interrogate "the idea of the dam," even though an essential constituency, Indigenous people, is frequently absent from the narrative.

Beyond the United States and Canada

The focus of this chapter has been the drowned towns of American and Canadian literature, but contemporary artistic media from around the world also contain notable instances of this narrative subgenre. A few prominent examples will show how drowned town narratives exist outside of white settler common sense and beyond literature. For example, the acclaimed 2012 French zombie television serial *Les Revenants* (*The Returned*, based on a 2004 movie of the same name, adapted for American television in 2015, where it was canceled after one season) detailed over two

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seasons the fate of a small French mountain town in which the dead begin to return in the same condition they died: a young boy killed by burglars, a young man who committed suicide on the day of his wedding, a young girl killed in a bus accident, a murder victim and a serial killer who was killed by his brother. The premise—that the dead return not as decaying zombies feasting on the flesh of the living but as the people they were when alive, with a measure of confusion and eventually a realization that they cannot remain undead—brilliantly mutates the conventional threat in a zombie narrative from the unyielding appetite of an invading mob (often metaphorically aligned with forms of xenophobia, racism, or consumerism) into the banality of existential alienation, grief, and the passage of time. The return of the living dead in this case is related to the collapse of the dam near the town 35 years earlier, reminiscent of historical dam collapses such as the Banqiao and Shimantan Dam collapses in Zhumadian, China in 1975, which killed 171,000 people, or the South Fork Dam collapse of 1889 in Johnstown, Pennsylvania, which claimed 2,209 lives. Large dams are mythologized in most drowned town fiction as durable monuments for which maintenance or collapse are rarely considered realities. *The Returned* fictionalizes monumental fragility and the ontological persistence of the accident. As Virilio wrote in his meditations on the accident, "The gradual spread of catastrophic events not only affects the reality of the moment but causes anxiety and anguish for generations to come."[339] Accidents haunt the future of all technological inventions: "To invent the family automobile is to produce the *pile-up* on the highway."[340] The integral accident has also become weaponized by state and nonstate actors alike. For example, in early 2016 it was reported that members of the Islamic State (IS) were using the Tabqa Dam, the largest dam in Syria, to hide high-value prisoners and protect senior officials, aware that the United States likely would not bomb the dam and flood substantial portions of Iraq. A flood would affect thousands of people in Iraq, and cut off electricity to eastern Syria.[341] Months later, Western media reported that Mosul Dam, the largest dam in Iraq, was in imminent danger of bursting and flooding "the middle of Iraq's most populated and developed areas sweeping downstream anything in its path, including bodies, livestock, buildings, cars, unexploded ordinances and hazardous chemicals," according to the US Army Corps of Engineers.[342] The failure of the Mosul Dam could have endangered 1.5 million Iraqis.

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As the dead in *The Returned* reappear decades later, the local reservoir begins to lose water. Action in the show crisscrosses the top of the reconstructed dam, which features prominently in the opening frames of the show's title sequence. A common feature of *reservoir noir* is the revelation of an old crime following the evaporation of a reservoir. In *The Returned*, the drowned town motif, this time not the consequence of deliberate flooding for hydroelectricity but still a consequence of hydrological engineering, assembles potent reflections on loss and the inevitability of death, and the sinking water level in the reservoir performs an infrastructural crisis as a mystery parallel with the return of the dead. Such parallelism in *The Returned* mobilizes the integral accident of a landscape fundamentally transformed into a horrifying mystery. Victor, the young boy who was murdered by burglars, had visions of the dam collapse before it happened and tried to warn others, but no one believed him. This Cassandra complex is the pivot on which the plot of *The Returned* revolves, and Victor, we learn in season 2, is the force behind the return of the dead. However, the spatial mapping of the show's uncanny trajectory posits the dam as a totemic structure. The collective historical trauma of the dam collapse on this small mountain town replicates the collective trauma in zombie narratives typically associated with an ideological force, whether it is the racist fear of Haitian slaves in early zombie narratives or the authoritarian conformity of consumerism classically satirized by George A. Romero. *The Returned* presents infrastructure as an integral feature of existential anxiety and generational trauma.

In *The Rocket*—a 2013 film from Australian director Kim Mordaunt, who also directed the 2007 documentary *Bomb Harvest*, about an Australian bomb disposal expert working in Laos—the construction of a dam in northern Laos forces seven-year-old Ahlo, his mother Mali, his father Toma, and his grandmother Taitok to flee the land on which their ancestors have lived for generations. The dam is a Laos government joint venture with Australia, which foregrounds the international networks of capital financing the hydrological construction boom in the Global South; consonant with the history of hydroelectric assemblages, the power generated by the dam in the film ultimately does not serve the displaced communities, who are given false promises about the form of their resettlement. *The Rocket* is formally inventive in one sense: it features an all-Laotian cast speaking

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Lao. In other ways, however, the film mobilizes generic conventions, especially melodrama and comedy, to present a story of two deeply traumatic historical realities: the secret bombing of Laos under US President Richard Nixon, and the more recent proliferation of dozens of large dam projects in Laos and other parts of Southeast Asia. In the film, the construction of a second dam, the Nam Dee Dam, in the valley where the Indigenous characters live is orchestrated by a transnational consortium. Toma takes Ahlo to visit the existing dam, where Ahlo swims in the reservoir as Toma watches a video produced by the consortium instructing everyone to leave the area. While swimming, Ahlo sees Buddhist statues at the bottom of the reservoir. This image of a traditional culture submerged by a hydroelectric project, combined with the first image in the film—a small water wheel operating in Mali and Taitok's village as they find a place for Mali to give birth to Ahlo and his doomed twin—are simple yet effective reminders of forms of subsistence living and traditional cultures destroyed by large dam construction. The story of the dam recedes in the overall narrative, and the second half of the film reaches a melodramatic crescendo at the annual rocket competition, in which the people of the per-capita most-bombed country in human history launch rockets into the sky for money and local prestige, a symbolic collective victory and retribution that sees young Ahlo, his father, and an orphaned girl they met along their journey find redemption and a plot of land to plant the mango given to Ahlo by his mother before she died. The film is a noted crowd-pleaser, for obvious reasons: the many traumatic events of the first act find largely pleasing resolutions in the third act. However, as well-acted and expertly structured as the film certainly is, it must be noted that the infrastructural violence depicted becomes invisible by the end, and characters find redemption for their suffering in ways that do not alleviate the fact that they have been permanently displaced; in fact, one could argue that Ahlo's transplanting of the mango picked from his mother's tree to the new residence for the family attempts to depict displacement as something that can be alleviated and can even have benefits (Ahlo wins the rocket competition, befriends the orphan Kia, etc.). While the film wants viewers to enjoy the resilience of Ahlo and family, its use of comedy and melodrama might enable viewers to overlook the scale of infrastructural violence that initiated Ahlo's journey.

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Finally, Jia Zhangke's 2006 film *Sānxiá hǎorén* (English title, *Still Life*; Chinese translation, *The Good People of Three Gorges*) is the best drowned town film, and probably the best film about infrastructure, ever made. Winner of the Golden Lion Award for Best Feature at the Venice Film Festival, *Still Life* follows coal miner Han Sanming and nurse Shen Hong as, independently of each other, they search for their long-lost partners in Fengjie, a city within the affected area of the Three Gorges Dam. The entire film was shot during the late stages of construction of the Three Gorges Dam. Shen Hong locates her husband, who left two years earlier, to ask him for a divorce. Han Sanming searches for his wife and daughter, and to earn money for his trip he works in the demolition of buildings to prepare for the flooding of the valley. These personal narratives take place against the backdrop of the Yangtze River and construction of the Three Gorges Dam. *Still Life* stages several outdoor sequences that layer the breathtaking scenery of Fengjie, the demolition of local cities, and the isolated characters, an aesthetic Ping Zhu calls "the poetics of debris."[343] If the task of infrastructure studies is, in part, to articulate what Brian Larkin calls "the politics and poetics of infrastructure,"[344] then *Still Life* may serve as a primary example of how politics and poetics intersect in the simultaneous creation and destruction of infrastructure. In China, the contemporary construction boom has been accompanied by a rapid demolition of older buildings that provides approximately 40 percent of the land used in construction.[345] According to Wade Shepard, in China "almost all buildings constructed before 1999—more than half the buildings currently standing—will be demolished and rebuilt in the next twenty years."[346] For the characters of *Still Life*, "their search for the past is carried out in a land where the past is being devastated,"[347] and the dramatic pace of construction and flooding leaves no time for individuals to recuperate from the destruction. Sanming, especially, embodies a silent suffering that contrasts with the national narrative of enthusiasm for market-focused development. As Zhu writes, "No matter how grand the official narrative of the Three Gorges project is, it is only felt by these marginalized individuals as an irresistible force of destruction."[348] Bifo describes the landscape to which Han Sanming returns as "a sort of hyperrealistic nothingness" typical of the "steady expansion of death in the sphere of all living organisms" under capitalism.[349]

Jia Zhangke is known for his aesthetic of languid social realism, and much of *Still Life* captures characters slowly and silently wandering through

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postindustrial wastelands in search of absent partners. The pacing in his films performs an "act of resistance" against the "violence of speediness" present in the rapid urbanization of Chinese communism.[350] The social realism in *Still Life* is memorably disrupted by two appearances of a UFO. In one scene, Shen sees a UFO fly across the Yangtze and over the mountains. In another, Shen speaks with archaeologist Wang Dongming, a friend of hers who is working in Fengjie at a heritage site before the flood covers it; their conversation frames a building in the background captured famously in 2007 by photographer Nadav Kander in an image titled *Fengjie III (Monument to Progress and Prosperity), Chongqing Municipality*, part of his award-winning series of images called *Yangtze: The Long River* (fig. 1.1). The building was originally constructed in 2003 as a monument to migration, was never completed, and was demolished in 2008. After their conversation, later that evening, the monument becomes a rocket ship that launches into the sky and out of frame.

Fig. 1.1
Nadav Kander, *Fengjie III (Monument to Progress and Prosperity), Chungqing Municipality*, 2007.

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As a formal disruption of the social realist narrative, the "UFO moments" in *Still Life* draw attention to the transition between the stories of Han and Shen; these surreal interruptions also emphasize how extraordinary the urbanization of China is to most of its citizens. The monument-turned-spaceship is a Brutalist structure in the shape of the Chinese character 華 (*huá*), which translates as "prosper." Industrial capitalist prosperity, the harbinger of destruction for most in this case, flies away from the characters of *Still Life*, leaving only the debris of the world they knew. The metaphor of the UFO also renders the unparalleled and continuing capitalist expansion. While the Three Gorges Dam might seem like an engineering megastructure of unsurpassable scale and impact, with a reservoir containing 42 billion tons of water and capable of slowing the rotation of the earth,[351] the scale of global infrastructural assemblages is now both planetary and extraterrestrial. Concomitant with a second concrete revolution on earth is a call for investment in "space infrastructure" such as telecommunications, broadcasting, off-planet habitation, and resource extraction, in addition to obvious military ambitions.[352] Jeff Bezos announced his intention to develop Blue Origin, an infrastructure for entrepreneurs interested in outer space. Against the capitalist current, in 2019 a group of scientists proposed leaving at least 85 percent of the solar system as "space wilderness," to protect it from capitalist expansion in the form of extractive industries.[353] But notable scientists such as theoretical physicists Stephen Hawking and Freeman Dyson have advocated for years that humanity should colonize space. What better metaphor is there for the colonization of space than a Brutalist monument in the shape of the Chinese symbol for prosperity transforming into a spaceship and launching into the night sky? After all, infrastructural brutalism on earth already extends to spaces remote from human habitation. Dioxins, polyvinyl biphenyls (PCBs), and other organochlorines have made the Arctic, for example, one of the most toxic places on Earth. Such drifting horrors are also beginning to amalgamate in ways detrimental to life: for example, scientists fear that channels of water opening in the Arctic ice, increased in volume by warming temperatures, may contribute to the presence of more mercury in Arctic food chains.[354] The Arctic ice also contains trillions of microplastic particles, in some cases as much as 2,000 times the density of pollutants in the Great Pacific Garbage Patch, which can be ingested by marine animals.[355] Microplastic debris was discovered in the Southern Hemisphere as far south as Punta Arenas, Chile,[356] near the

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southernmost tip of the Patagonia region. Punta Arenas is now a hub for the Chilean oil industry. The hydropolitical story that opened this chapter, a historiography of water depicted by Chilean director Patricio Guzmán in *The Pearl Button*, traced the riparian flows from Indigenous cosmology to the horrors of colonialism and dictatorship in the Patagonian peninsula. Infrastructural brutalism promises a return to the stars, most likely (and tragically) out of necessity.

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2 The Materiality of the Road in the "Road Movie"

> Control is not discipline. You do not control people with a highway. But by making highways, you multiply the means of control.
> —Gilles Deleuze

> We don't need a map to keep this show on the road.
> —Fozzie and Kermit, *The Muppet Movie* (1979)

The visibility of roads and their accessories—gas stations, strip malls, oil pipelines, and so on—has made automobility unavoidable in artistic genres. One genre in particular, the road movie, gets its name from infrastructure, and yet theorists of this popular film genre rarely incorporate consideration of the road itself into their analyses; instead, road movie theory tends to emphasize speed and identity, the supposedly rebellious quality of road movie narratives, instead of the constraints of the concrete path on which antiheroes escape the oppressions of industrial capitalism. In this chapter, I examine *The Wizard of Oz*, *Wild at Heart*, and *TRON* as exemplars of what, after Alexander Galloway, might be called protocological control, the road as the constrained technicity of liberalism, which I argue has been overlooked as a primary determinant in the road movie genre. One kind of road movie, the existential road movie exemplified by films such as *Two-Lane Blacktop*, *Vanishing Point*, and *Drive*, actually foregrounds the road as an ontological inevitability, but in doing so this especially white subgenre erases "transportation racism"; in other words, at the peak of its popularity, the road movie erased the infrastructural predicates of the interstate highway and effaced the racist violence of highway construction. I conclude with a consideration of postapocalyptic road movies such as the *Mad Max*

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franchise. Postapocalyptic road movies explore the disappearance of protocological control, a speculative politics of life and death in the absence of the state form. The road movie, in this context, represents a specific struggle with liberal governmentality within the confines of infrastructural brutalism.

Automobility and Governmentality

In the tradition of Harold Innis and James Carey, Jeremy Packer explores the historical relationship between transportation and communication. For Packer, this relationship is a "political rationality" that attempts to consolidate and expand "the possibilities of liberal governance."[1] Specifically, he analyzes "how driving behavior and the mobility it creates have been dually represented, on the one hand, as having great potential and, on the other, as a serious threat to social order."[2] His analysis follows a trajectory familiar to Foucauldian governmentality literature, which posits neoliberal governing as something that "depends not simply on legal compliance, but also on the production of subjects whose freedoms and responsibilities necessitate their investment and belief in popular truth. In simple terms," Packer writes, "following the law is not necessarily as important as being safe."[3] The discourse of safety unites transportation and communication in the neoliberal governing order. In this context, he argues, "struggles over mobility and access thus need to be examined in both the virtual and material realms."[4] A central component in the production of subjects who prize "freedom that accords with the expansive demands of culture and economy,"[5] or freedom that produces governability, is popular culture, specifically, according to Toby Miller, the discourse of genre.[6] For Miller, genre is "simultaneously textual, economic, and social," and "these concepts and their parental human sciences are technologies of governance, systems of ordering conduct."[7] In what follows I argue for one form of struggle over "mobility and access" by examining the genre of the road movie (and its generic cousin, the virtual reality movie) in terms of Alexander Galloway's notion of *protocol*. The concept of protocol returns the focus of genre analyses to the material technical delimitations of automobility and its attendant offers of psychic freedom.

In her book *The Road Story and the Rebel: Moving through Film, Fiction, and Television*, Katie Mills employs the term "automobility" to represent

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the perceived autonomy and mobility of identity construction in the road movie genre.[8] Mills's treatment of the genre echoes a common articulation of form and content in the once-prototypical American story: "The road genre offers a pop cultural forum for imagining a fluid self and new genres of relating with others."[9] Given the emphasis on autonomy and mobility in much road movie scholarship, it is surprising how many theorists define the genre in terms of the affordances of vehicles and not the constraints of the road. This tends to be the case even though in road stories "the concept of liberty is most consistently defined as freedom of movement,"[10] and not as a particular form of movement. Automotive movement is generally only as free as the road permits. Never mind the off-road fantasies of various truck and SUV commercials; or, rather, mind them as indications of just how powerful the desire is to contravene the rules of the road. Mills's reading of the road movie does not capture the reactionary quality of the genre, in part, I suspect, because of the absence of a proper discussion in the road movie literature of how the road determines the aesthetic and narrative boundaries of the genre. A broader definition of automobility must be considered to account for the central tension of the genre, a tension that several road movie theorists frame as a kind of limitation to the freedom of the road, sometimes even a fatalism of the road trip. The limitations or affordances of the road movie narrative return attention to the materiality of the road.

The Paradoxes of Automobility

John Urry's use of the term *automobility* incorporates elements similar to Mills's usage, but expands the definition to recognize that "what is key is not the 'car' as such but the system of fluid interconnections" among vehicles, roads, and various extensions of this ecology.[11] Automobility, for Urry, "can be conceptualized as a self-organizing autopoietic, nonlinear system that spreads world-wide, and includes cars, car-drivers, roads, petroleum supplies and many novel objects, technologies and signs."[12] This definition foregrounds the systemic materiality of the road rather than the ephemeral desire for freedom. Considered aesthetically, this definition of automobility puts the road back into the road movie. The essential component of this definition is the paradoxical observation that "automobility is thus a system that *coerces* people into an intense *flexibility*."[13] The "paradox in the

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promise of automobility," as Cotton Seiler calls it,[14] actually has a surprisingly extensive history in American writing about cars, but Seiler believes automobility must be considered a greater force than Urry's "system of fluid interconnections": "More than merely a set of policies or attitudes cohering around cars and roads," writes Seiler, "automobility comprises a 'multilinear ensemble' of commodities, bodies of knowledge, laws, techniques, institutions, environments, nodes of capital, sensibilities, and modes of perception."[15] Seiler invokes Foucault's notion of the *dispositive*, or *apparatus*, to capture the expansion of governmentality that followed the paving of America. "Automobility—in particular that of the elevated, limited access highway of the postwar era," Seiler charges, "provided a quotidian performance of both autonomous self-direction *and* acquiescence to systemic parameters. To drive, in other words, was to live motion without change."[16] "To live motion without change" aptly captures the self-deluding equation of movement with liberation—often either overtly or implicitly incorporated into road movie analyses—and, more broadly, the workings of Foucault's disciplinary society. In fact, the phrase "to live motion without change" also defines the experience of the audience for a road movie, something not lost on Devin Orgeron, who calls the motion of the road movie a "seductive illusion."[17] It is therefore not surprising, as anthropologists Penny Harvey and Hannah Knox have noted, that roads appeal to citizens as much as they do to banks and governments: "roads continue to invoke, and to materialize, that fundamental principle of ordered freedom that underpins both modern politics and modern science."[18]

The paradox of automobility expressed by Urry, Seiler, and others—driving as a freedom born of coercion, the road as built environment or "substrate" for liberal society[19]—parallels Galloway's notion of *protocol*, a form of control based on technicity. Galloway compares the distributed networks of the interstate highway and the Internet, both open systems that achieve openness through voluntary submission to technical protocols (the TCP/IP protocols of the Internet, or the lane markings, signs, and other affordances of highway travel). To enjoy freedom of movement on the interstate highway, one must observe the technical parameters of the road; to enjoy the freedom of communication between computers on the Internet, those computers must speak the same language and observe the same technical protocols. Galloway's work provides this chapter with a theoretical conjunction between the road movie and virtual reality films, which also

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depict motion as something achieved by stasis; both genres exhibit freedom as a function of technicity.

For the road movie, the voluntary submission to parameters of protocological control helps explain the central generic tension regarding the material circumscription of the road rather than the vehicles that travel upon it. Most theorists of "road" movies have focused almost exclusively on vehicles in these films. David Laderman, for example, sees the road movie as a specifically "modernist" genre, driven, as it were, by the mechanization of movement and the modernist romanticization of technology.[20] He does not mention *The Wizard of Oz* in his introduction, presumably because Dorothy does not drive a car; "traveling in a motorized vehicle is what road movie characters do," writes Laderman.[21] While he admits, "More significant than the proliferation of the automobile as stylized commodity is the construction of the *actual* interstate highway system,"[22] his discussion of the road movie focuses solely on motorized vehicles and the act of driving. A similar oversight, though one more attuned to the problem of roads, appears in the 2006 anthology *Crossing New Europe: Postmodern Travel and the European Road Movie*. The editors foreground the materiality of the road:

> The type and characteristics of the actual roads along which the [European road movies] are set produce perhaps the most important distinction—the open spaces of North America, with their straight, boundless highways and the sense of freedom and opportunity to reinvent one's life, are in clear contrast with the European reality of a mosaic of nations, cultures, languages and roads, which are separated by geographical, political and economic boundaries and customs. In European films the emphasis is either placed on crossing national borders or, in the case of national travel, on the landscapes that voyagers traverse, moving, for instance, from deprived to wealthy areas, from the country to the city, or simply through regions presenting different cultures and characteristics.[23]

The insight here is astute but incomplete, and ultimately the authors of the anthology are most interested in the "geographical, political and economic boundaries and customs" that separate European regions, rather than the materialities of the roads that connect these regions or extend within them. The book's editors note important distinctions between the forms of transport (public transit or hitchhiking in European films versus the private car or motorbike in American films) and types of travelers (outcasts in America, "ordinary citizens" looking for work or immigration in Europe), but the problem of the road itself is never adequately discussed.

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Together, road movies and virtual reality films are expressions of what I will call *foregrounding the apparatus*. The *apparatus* is a term that recognizes the paradoxical freedom of distributed networks, a freedom derived from the coercion of technological delimitations; the genres in question typically *show* or *foreground* the apparatus that produces reactionary forms of governmentality. A protocological reading of these genres can begin to articulate the constraints of technicity, in the form of a road movie such as *The Wizard of Oz* (1939), or in the form of a virtual reality film such as *TRON* (1982). Typically, films that foreground technically restrictive freedom appear during the emergence of new forms of protocols. The meditative and pivotal quality of the Yellow Brick Road in *The Wizard of Oz*, for example, captures the emergence of newly surfaced roads across America, but before the period of ubiquitous automobility. *TRON* transforms the Yellow Brick Road into the circuitous control of the so-called network society, at the birth of personal computers and networked computing. The contradictions of highway and cyberspace protocol are better understood in terms of Galloway's central insight: "The founding principle of the Net is control, not freedom. *Control has existed from the beginning*. Perhaps it is a different type of control than we are used to seeing. It is a type of control based on openness, inclusion, universalism, and flexibility. It is control borne from high degrees of technical organization (protocol), not this or that limitation on individual freedom or decision making (fascism)."[24] On the protocological road, the buoyant refrain "follow the Yellow Brick Road" becomes less the jubilant expression of deliverance from self-imposed exile and more the controlled imperative of industrialized wandering. Or, as Cotton Seiler states, "in these moments of danger that threatened capitalist-liberal hegemony by destabilizing its narrative of selfhood, automobility performed a crucial restorative role by giving that selfhood a vital form conducive to the existing arrangement of power."[25] Is it any wonder that Dorothy's excursion ends in a solipsistic arrival?

The Central Tension of the Road Movie

Theorists of the road movie are particularly attuned to this dynamic—a contradictory impulse, an overbearing sense of control in the emancipatory structure of networked abandon—and characterize this central tension as everything from a classical ontological trope of movement versus stasis to

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a figure for the act of interpretation and its inherent ambiguities. Steven Cohan and Ina Rae Hark argue that the road movie "sets the liberation of the road against the oppression of hegemonic norms," projecting "American Western mythology onto the landscape traversed and bound by the nation's highways."[26] Typically, one half of this dialectic—the "liberation of the road," and not the ways in which the liberation is "bound by the nation's highways"—is foregrounded as the more salient feature of the road movie; but always the liberation of the road is bound, the outlaw posture always curbed and directed by the asphalt and markings on which it flees. David Laderman describes the road movie dynamic as "a *tension* between rebellion and conformity." The rebellious trajectory of classic road movies, often exemplars of sixties counterculture, remains diminished or subverted by the traditions from which it flees.[27]

In generic terms, Laderman poses this qualified form of cultural critique as a "distinctively modernist staging of a rather classical, perhaps timeless and universal struggle between two primal drives: the dynamic and the static."[28] Devin Orgeron echoes this sentiment, arguing that road movies "extend a longstanding cinematic tradition that posits a hopeless and lamentable mobility in an effort to eulogize or find *stability*."[29] In his view, this dichotomy of mobility and stability is informed by a reactionary nostalgia, "a desire to roll history back, to return to a pre-technological, mythically innocent moment."[30] However, the contradictory impulses of the road movie, according to Laderman, are "confined by the conventional roadblocks of classical genre film,"[31] whereas Orgeron sees the generic contradictions as emanating from a "desire to both admire *and* critique American mythologies in a distinctly European dialect."[32] The road movie has always been "inherently schizoid," claims Michael Atkinson, "offsetting our mad romance with the internal combustion engine, upholstery, tailfins and endless asphalt with a seemingly unpreventable collapse into failure and pain."[33] For Stuart C. Aitken and Christopher Lee Lukinbeal, the central tension of the road movie exists at the hysterical "edge of self-identity, being simultaneously motionless (holding onto the seat of one's identity) and in motion (transcending social/spatial scales and annihilating space and time)," a psychoanalytic expression of the road movie paradox.[34] For Christopher Morris, road movie quests are "not only futile but repetitive" because they "anticipate" and dramatize "paralysis and redundancy in reading."[35] Morris sees road movie reflexivity as analogous to the Derridean "act

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of reading."[36] The genre itself is elusive and full of contradiction because the road is a figure "for reading itself."[37] The liberation of the road, then, is bound by the impossibility of the journey, just as meaning through interpretation is bound by interpretive aporias: "the road journey repudiates the idea of arrival at something worthwhile; redundant endings vitiate beginnings."[38] Finally, Corey K. Creekmur reminds us, "Every American who knows 'there's no place like home'—the mantra of America's most famous road movie—also remembers that 'you can't go home again.'"[39] Folk wisdom frames the freedom of the road trip as redundant, futile, and, upon return home, somewhat tragic.

Whether a classical trope, a generic limitation, a hermeneutic blindside, or a slice of American common sense, the central tension in the road movie—and, as I argue, in the virtual reality movie—expresses an emancipation based on movement and speed and dislocation that is always constrained, redundant, or perhaps unadvised. The road should be a path to freedom, these films want to believe, just as computers conjoined by common languages should embody a form of communicative autonomy. But as Galloway demonstrates, distributed networks such as the highways and the Internet only achieve autonomous postures through the imposition of a reactionary protocol, a set of procedures that enable data transmission between computers or traffic passage between destinations, "a distributed management system that allows control to exist within a heterogeneous material milieu."[40] To illustrate computer protocol, Galloway uses the analogy of the highway system:

> Many different combinations of roads are available to a person driving from point A to point B. However, en route one is compelled to stop at red lights, stay between the white lines, follow a reasonably direct path, and so on. These conventional rules that govern the set of possible behavior patterns within a heterogeneous system are what computer scientists call protocol. Thus, protocol is a technique for achieving voluntary regulation within a contingent environment.[41]

For the Internet, protocol is constructed based on what are called RFC (request for comment) documents. These documents are compiled by experts and contain rules and recommendations for technical standards. On the basis of these standards, open communication is possible on the Internet; that is, the communicative freedom engendered by computers on the Internet is a product of submission to reactionary technical standards. Galloway returns to the analogy of the road to explain the functioning

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of computer protocols, which delimit control in an otherwise open and decentralized system (whether Internet or interstate highway): "signage and police compel [the] driver to slow down. . . . Bumps, on the other hand, create a physical system of organization. They materially force the driver to acquiesce."[42] "Bumps," the exemplar of protocological control in this example, shape voluntary submission in a distinctly different fashion than the coercion of police surveillance.

Cold War Fears and Distributed Networks

Both the interstate highway and the Internet emerged during the Cold War for the purposes of facilitating increased mobility and communication in the event of a nuclear war;[43] in both cases, the specter of war was the impetus for subjecting a greater portion of the populace to "high degrees of technical organization" in the service of open transportation and communication. To forward the case for a federally funded interstate highway, the highway lobby tapped into a popular perception among ordinary Americans that the Soviet Union wanted to "rule the world" and that a nuclear attack was imminent.[44] In addition, "Eisenhower's appointment of a general to head the advisory committee made plain the connection between highways, national defense, and the fear Americans had about their security."[45] Eisenhower's own experience during and after World War II convinced him that railroad lines were much easier for invading armies to disrupt; a highway, such as the autobahn he witnessed in Germany after the war, "proved a harder target."[46] Despite Eisenhower's conviction, and the popular sentiment of the American public, the interstate highway was arguably not necessary for improved national defense:

> Even though about 80 percent of war materials in World War II had been moved by rail, the alleged strategic need for an interstate system for national defense became the main argument of the highway lobby. In 1956 the official name of the system became the National System of Interstate and Defense Highways. National defense was the major justification for increasing the federal share of funding from the 60–40 ratio in the 1944 Federal Aid Highway Act to 90–10 in the 1956 Interstate Highway Act and for permitting federal funds from general tax revenues as well as special user taxes to be used for building the system. St. Clair and Leavitt both demonstrate convincingly that, contrary to the contention of the Road Gang, the Interstate System was never essential to national defense.[47]

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The highway that ushered in a new automotive culture was couched in militaristic parlance but characterized by a different form of control than traditional hierarchical military authority. Instead this was a protocological road, a technicity wrapped in the flag but managed by a distributed and voluntary regulatory mode.

Americans who desired freedom in the form of automobility—and their government, which desired military advantage in the form of distributed networks—had to accept the rules of the road. At the turn of the twentieth century only seven percent of American roads were surfaced,[48] and from 1900 to 1929 the number of registered automobiles in America increased from 8,000 to 23.1 million.[49] An automobile culture existed, and even flourished among the middle class into the 1920s, but it was not until after the passing of the Interstate Highway Act in 1956 that driving became a pastime of working-class Americans.[50] Following the passage of the Interstate Highway Act, "motor vehicle registrations in the United States . . . more than doubled, from 49.2 million in 1950 to 108.4 million in 1970."[51] This period also witnessed some of the most famous road movies, such as *Catch Us If You Can* (1965), *Bonnie and Clyde* (1967), *Easy Rider* (1969), and *Five Easy Pieces* (1970). While the films themselves often embodied the outlaw spirit and the countercultural disaffection of the 1960s, the newly paved and marked interstate roads on which escape from societal conformity was made possible were the product of state-sanctioned technological regulations. The fatalism expressed in many of these films reflected the dawning awareness of the counterculture's overall failure to transform American society, so eloquently and forcefully depicted in Hunter S. Thompson's road reportage, *Fear and Loathing in Las Vegas*, later turned into a film directed by Terry Gilliam (1998); but at least part of the fatalism was derived from the material circumscription of the road as another form of control. Critics who focus on the liberatory quality of the roads optimistically foreground desire over material constraint: movement attempts to supersede technological control. But the birth of the interstate highway offered another form of voluntary submission to technical control: it offered only two evenly demarcated trajectories, only two directions for individuation. The limitations of this material reality made the highways cause for lamentation as much as celebration. As Thompson wrote, "Old elephants limp off to the hills to die; old Americans go out to the highway and drive themselves to death with huge cars."[52]

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The Wizard of Oz and Centrifugal Space

The most famous American road movie precedes the period of interstate highway expansion and does not feature an automobile. *The Wizard of Oz* features a bicycle, a horse-drawn carriage, a hot air balloon, and a flying broomstick, but there is no car and thus no evidence of a modernist sensibility; and so, according to Laderman's criteria, this is not a "road" movie. The movie opens with Dorothy following a dirt road back to her family's Depression-era Kansas farm. Later, Miss Gulch arrives with her bicycle on the dirt road. After Miss Gulch takes Toto and rides away, he escapes and he too follows the road, this time back to Dorothy's room. The next invocation of a road is the Technicolor phantasm of the Yellow Brick Road, which, unlike any interlocking meshwork of paved roads, has a beginning, a point of origin. As if to punctuate the emerging voluntary submission to the technicity of the surfaced road, Dorothy begins her journey by walking along the spiraling origin of the Yellow Brick Road, instead of simply walking (or skipping) directly to where the road expands and exits Munchkinland. The singsong directive to "follow the Yellow Brick Road" is the transformative moment in *The Wizard of Oz*, one of the great departures in the history of American leaving, and a recognition at the dawning of widespread surfaced roads that the impoverished dirt tracks in front of Dorothy's Kansas farm are the sepia-toned engravings of the past and not the vibrant gold-bricked prosperity of the future. This movie is more about the coming of (surfaced) roads than any other American road movie.

Arriving as it does at the tail end of the Great Depression, *The Wizard of Oz* captures the longing to escape the desperate conditions of the Depression, and simultaneously captures the lack of automobility for most of the people attempting this escape. Many people hit the road during the 1930s "simply because there were no jobs or because their families were disintegrating around them."[53] This carless exodus produced the ultimate irony of the period: "in a world where so many took to the road, so few had any real mobility."[54] Dorothy's experience embodies this contradiction. By imagining her trip to Oz, she leaves without moving. Her paradox exemplifies the "fantasy culture of the 1930s," which "is all about movement, not the desperate simulation of movement we find in the road stories but movement that suggests genuine freedom."[55] The road symbolized a "thrust toward the future"[56] in Depression-era culture, even without the mobility of an automobile.

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Some have suggested Oz is an allegory of Franklin Roosevelt's New Deal, an idea promoted by *The Wizard of Oz* lyricist E. Y. Harburg, a dedicated socialist, in an interview with the *Washington Post* just before his death.[57] Dorothy escapes the dust bowl of Kansas, but amidst the many perils of the land of Oz, such as the fascist threat of the Wicked Witch, the Yellow Brick Road leads assuredly to the Emerald City and the New Deal antidotes to Depression-era misery, with the Wizard himself "a good-natured satire of Franklin Roosevelt."[58] The "movement" of this road movie imbues the Yellow Brick Road with futurity, the promise of mobility and purpose without the mechanized means to establish "a sense of transcending the boundaries of scale."[59] It is the speed of later road movies that performs the disappearance of the road itself, and gives the impression that the central tension of the road movie is something immaterial: genre, classical trope, the act of reading. The sense of transcendence engendered by speed is, ultimately, as Aitken and Lukinbeal argue, "only a sense . . . a psychic freedom that offers emancipation but, in actuality, practices emasculation."[60] Perhaps this is why Dorothy's dream does not proffer the same disillusionment as many post-1956 road movies, the feeling that once the tires stop spinning so too does the emancipatory buzz. Dorothy's song and dance on the Yellow Brick Road never escapes the material technicity of passage, and everyone she meets in Oz, whether friend (the Scarecrow, the Tin Man, the Cowardly Lion) or foe (the flying monkeys), engages her on or just off the road, a fantastic manifestation of America's burgeoning road ecology.

The great irony of *The Wizard of Oz* is Dorothy's conflicting desire both to find "a place where there isn't any trouble" while she is in Kansas, and later, while in Oz, "to get out of Oz altogether," what Pamela Robertson calls "the road movie's contradiction between the desire for home and away,"[61] and what Salman Rushdie calls "the purity of an archetype . . . the human dream of *leaving*, a dream at least as powerful as its countervailing dream of roots."[62] Dorothy wants to be nowhere and somewhere simultaneously. In addition to being an archetypal desire, her hysterical and hyperbolic inclination to leave in spatially expansive terms ("a place where there isn't any trouble," "over the rainbow," "out of Oz altogether") is only contracted by the protocological space of the road. While certainly Dorothy's expansive gestures are the product of an adolescent penchant for exaggeration, they also reflect the changing complexion of Depression-era America as its

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growing road system enabled its citizens to imagine a more broadly striated country, in which hope and futurity were spatially arranged.

From the moment Dorothy begins her journey on the Yellow Brick Road and its originary spiral, she is tracing the outward movement of what Edward Dimendberg labels "centrifugal space."[63] Centrifugal space is a "determinant feature of the built environment of modernity," and "largely defines the geographic arrangement of the United States after 1930." The highway, with its propensity for speed and sprawl, "may well be the preeminent centrifugal space of the twentieth century," replacing the centripetal navigation of the street and the railroad in pre-1930s cinema.[64] As Dorothy prances away from the munchkins and the smoking carnage of the Witch of the East, she first walks in a spiraling motion, then heads for the centrifugal space of Oz with gathering speed, before stopping to wave goodbye to the munchkins. When next we see Dorothy, she has reached a crossroads. The efferent road becomes multitudinous assemblage. Eventually Dorothy and friends will enter the metropolis of the Emerald City, whose skyline resembles that of New York City. Dorothy travels from the dirt roads of Kansas, an engineering nowhere, to the sparkling modernity of somewhere. Instead of a romanticized modernity that celebrates "technology as a liberating force that can lead us into the future,"[65] the Emerald City offers a vision of technology as a form of cunning magic, and the purveyor of progress as a charlatan. Also unlike Laderman's road movie, *The Wizard of Oz* does not follow a mechanized escape from "choking industrialized stability"[66] but instead echoes another classic theme of American film, the "portrait of hicks from the sticks arriving at the metropolis."[67] This trajectory of events in *The Wizard of Oz* is a consequence of the film depicting the burgeoning promise of roads prior to the ubiquitous ownership of cars, a brief moment in American car culture during which centrifugal space outstripped a pervasive capacity for sense-distorting velocity, and the protocological road was imposing technical control only on a relatively small and affluent segment of the population. Consider that the major transformation in American roads during the twentieth century was not quantitative but qualitative: "The U.S. road system has less than doubled in length since 1900. What has changed is the quality and capacity of that system."[68] The Yellow Brick Road is a reminder of the qualitative material transformation of America's roads. By the end of the 1950s centrifugal space had thoroughly transformed American social life, and by the end of the 1970s the protocological

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road entered the American imaginary not as a golden-bricked futurity but as an asphalt scar of misshapen and abusive social planning.

Wild at Heart and Paved on Top

By 1980, "some 87.2 percent of American households owned one or more motor vehicles, 51.5 percent owned more than one, and fully 95 percent of domestic sales were for replacement."[69] Road movies acquired a distinctively fatalistic tone in the 1960s and 1970s, and by the 1980s and 1990s, with almost every American household in possession of a motor vehicle, the fatalism of the outlaw journey frequently turned into ironic deadpan or postmodern pastiche. As Michael Atkinson wrote of this era, "lately, everybody is packing into the nearest stolen roadster, slapping an Elvis tape into the stereo and leaving their ruined lives behind."[70] The common critical consensus for years has been that the road movie became exhausted by the same postmodern aesthetics that proclaimed the "end" of everything. Atkinson expressed this consensus most famously in his review of the genre for *Sight and Sound*:

> Today, there's little frontier to speak of and little hope of national rediscovery, and the movies confirm the generational sense of Generation-X defeatism by transforming the travelled landscape into a bricolage of cinematic tropes—especially the omnipresent stench of burnt gunpowder and smoking bodies—and by being, with or without a helpful dollop of irony, unabashed Road Movies. Characters hit the road less for any concrete, plot-driven reason than because they've seen a lot of movies and that's what you do. Objectively speaking, what could be more of a dead end?[71]

While clearly an epochal cultural discourse one might categorize as postmodern did have influence on the road movie genre, the material circumscription and central tension of the protocological road—by the 1980s a form of technicity experienced by most Americans—more centrally informed the aesthetic of the road. More frustrating than the loss of a frontier, to white settler publics, is the repeated experience of voluntary submission to technical control. Consider the quotidian experience of commuting to work as a measure of this repeated submission to technicity. The segment of workers who commuted across county lines in the United States in 1960 was about 15 percent; by 1980, about 20 percent of workers commuted; and by 2000, more than 25 percent, over 34 million workers, commuted.[72] The

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expansion of centrifugal space in the postmodern era is matched by the proliferation and banality of carbound duties.

Typical of the road movie in this postmodern era is David Lynch's *Wild at Heart* (1990), in which *The Wizard of Oz* acts as an archetypal icon of pop art self-fashioning, and the road trip is a journey into what Atkinson calls "the ragged outskirts of pop culture."[73] In *Wild at Heart*, the paradoxical push and pull of the road in Oz becomes an emblem of the futility of desire, couched in the cultural pastiche of Sailor and Lula. Sailor and Lula play the part of desperate outlaws on the lam, but their experience of the road is so completely hemmed in by four decades of centrifugal space that actions reverberate only as unconscious evocations of pop culture iconography, perhaps best illustrated by Sailor's rehearsed declaration that his snakeskin jacket is a "symbol of [his] individuality and [his] belief in personal freedom." Like Dorothy, Sailor and Lula did not have to leave in order to arrive at their destination; the destination was always a function of self-invention. Lynch explains the frequent allusions to *The Wizard of Oz* in *Wild at Heart*—"with Marietta's picture disappearing at the end; when Bobby Peru is with Lula and she clicks the heels of her red shoes together; the Good Fairy at the end"[74]—as an expression of a central tension in *The Wizard of Oz*: "There's a certain amount of fear in the picture," he says, "as well as things to dream about. So it seems truthful in some way." The "truth" of *The Wizard of Oz* is synonymous with how Galloway defines protocol: "protocol appeals to the body . . . it always operates at the level of desire, at the level of 'what we want.'"[75] With those "bumps" in the road, Galloway says, "the driver *wants* to drive more slowly." For Lynch, desire is the bump in the road, the constraint that produces voluntary social organization, even if it is an organization that is "wild at heart and weird on top." If the road movie lost some of its idealistic and naturalistic verve in the 1980s and 1990s, this is most likely because hitting the road became less of a conscious departure and more of an unconscious necessity in industrialized societies. Protocological technicities redounded with habitual frequency. In *Wild at Heart*, the Yellow Brick Road is depicted as the striation of the Symbolic order it always was, America looking at itself in a mirror after a long and strange love affair with the automobile.

Films that depict the protocological road, films that *foreground the apparatus*, often appear at the emergence of a new form of protocol. *The Wizard of Oz* appears before interstate highway expansion but captures the

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emergence of centrifugal space in distributed networks. The virtual reality movie is similarly "protocological," in that its central tension derives from an increasing social organization at the level of computational rules. The distributed networks of the Internet, like the interstate highways, were born of Cold War logic but protocological instantiation. Of the different sources for the development of packet switching technology in the late 1950s, the forerunner of the ARPANET and later the Internet, RAND engineer Paul Baran's proposal for the necessity of "survivable communications" in the event of a nuclear war led him to formulate "distributed communications."[76] Even if part of the communications system were downed by war, messages could be rerouted to arrive at their destinations. The now-familiar history of networked computing eventually merged with another technological trend that began in earnest in the late 1970s and early 1980s, personal computing: "By 1984 personal computer sales [in the United States] accounted for more revenue than IDC's large, medium-sized, or small computer market segments, with shipments of 9.7 million personal computers for a total revenue of some $17 billion, bringing the installed base in 1984 to 23 million machines."[77] If by 1980 the hegemonic protocological road was the interstate, the emerging protocological road was that of the intertwining personal computer user and networked computing.

TRON and the Virtual Other

The dreamstate metaphorics of Oz find their late twentieth-century counterpart in the technocultural discourse of virtual reality films such as *TRON* (1982), *Brainstorm* (1983), *The Thirteenth Floor* (1999), *eXistenz* (1999), and the *Matrix* trilogy (1999, 2003, 2003). The mechanization of transportation cedes to the computerization of mobility, and the circuit is the road on which code rides. The vehicular extension of the body[78] is replaced by its digital doppelganger, an elecTRONic Other that acts and is acted upon by the discursive forces of the mode of information. In films such as *TRON* and *The Matrix*, the quest for liberation from the panoptic power of the code is achieved by the ability of the hero to transform the virtual environment from a conventionally authoritarian one to a protocological one; however, like the road movie quest, this journey is haunted and ultimately contained by the paradoxical freedom of technical regulation. This central tension, depicted in *The Wizard of Oz* as the journey Dorothy takes while being

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motionless, occurs in the virtual reality film in the form of the often seated protagonist who ports with a computer by being plugged into or, in the case of *TRON*, interpellated by an extension of the computer.

In *TRON*, which appeared at the height of video arcade game's popularity, the Oz-like centralized authority is the Master Control Program (MCP), an oppressive artificial intelligence that controls the virtual world of the film. Hacker Kevin Flynn is trying to access a file being hidden by the MCP when he is literally transported into the computer, in a scene reminiscent of Dorothy's tornado vortex to the Land of Oz. In fact, virtual reality films often feature some form of kaleidoscopic flux that represents the transition from real world to virtual world; the visual precursor for these trippy transformations is the psychedelic monolith sequence from *2001: A Space Odyssey* (1968), but thematically *The Wizard of Oz* with its famous tornado-to-Technicolor transition is the primary cinematic referent for the beginning of many virtual reality journeys. Orgeron suggests that "changes in film stocks and a general consciousness about the effect of the 'material' of the cinema on the efficacy of the journey have become fundamental icons of the road genre,"[79] citing examples such as *Wild at Heart*, *Thelma and Louise* (1991), and *Natural Born Killers* (1994). If Dorothy's famous declaration that she's "not in Kansas anymore" is the line that separates Depression-era dirt roads from surfaced roads, then the digital vortex that often represents real-to-VR transitions is visual shorthand for the same thing in postindustrial aesthetics. When Flynn tries to hack into the MCP in the real world, the MCP warns that it will "have to put [Flynn] in the game grid" to "see what [he] is made of." The transition from real world to "game grid" is depicted at first as like looking into a kaleidoscope, which then turns into a vortex, which ends with a digital image of a circuit board, which transforms into a digitized globe and is hovered over as in the *2001* sequence, until the camera peers into one of the I/O towers and Flynn is deposited in VR form. From the drab colors of the real world, Flynn transforms into the neon articulations of the virtual reality world, an effect achieved by "backlight animation," a visual differentiation of ontologies similar to *The Wizard of Oz*'s use of Technicolor.

Flynn's database search is depicted as a literal war between the libertarian forces of Flynn's "Users" and the panoptic power of the MCP's "programs." As in *The Wizard of Oz*, characters from the real world have their virtual counterparts. The programs created by Flynn and other Users are

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portrayed in the virtual world by the same actors who portray their Users. The journey to the MCP across the striated paths of the circuits uses virtual cars, tanks, and planes. These vehicles must follow the geometric striations of the digital world. Cars drive along gridlike digital planes. Some of the flying machines travel along beams of light. For a User like Flynn, the beams can be redirected, and at one point in the film he redirects a beam to avoid colliding with an enemy ship. On another occasion, he creates a flying machine called a Recognizer from the digital detritus of his environment, a manipulation of virtual space of which only Users are capable; Neo's manipulation of time/space in *The Matrix*, both in the "bullet time" sequence and at the end of the film when confronting the Agents, offers a later exemplar of the same phenomenon. The goal of Flynn's quest while he is "in" the computer is to make accessible a file that betrays the duplicity of his former employer. In the process, he hacks the MCP and disables its dictatorial control over the system. At the end of the film, the I/O towers of the virtual world light up, signaling that the system is now open and communicating with other networks. *TRON* ends, that is, with the triumph of computer protocols, of "survivable communication," the openness of digital communication made possible by submission to reactionary regulations.

As a subset of the science fiction genre, VR films (often categorized as cyberpunk) foreground mobility as a narrative "structuring device."[80] The immensely popular *Matrix* films gave us a "representation of movement that has not previously been possible."[81] And yet the same dynamic or central tension that haunts the road movie can be found in the VR movie. "The impossible bodily movement of *The Matrix*," as Anne Cranny-Francis says, "enacts the perceived (conceptual) freedom of post-industrial information societies, while also signifying its dependence on the technologies it deploys—the immobile body of the operator jacked into the machine."[82] The information society practice of Web interface "navigation" elicits a similar practice of imagining movement while stationary. *TRON*, *The Matrix*, and other VR movies participate in this assemblage of popular culture and neoliberal practices. Perhaps *TRON* is also an appropriate exemplar of the protocological road because it features an actual road race, albeit a digital approximation without dirt, dust, or even a proper road. The "light cycle" race, in which digitized motorcycles crisscross a matrix while making 90-degree turns and attempting to enclose or block their opponents with the solidified trace of their passage, foregrounds simultaneously the

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act of movement and the "high degrees of technical organization" typical of protocol. The light cycles cannot make diagonal movements; they are restricted to perpendicularity. Winning the race involves using the protocological restrictions against your opponent. And still, even within the enclosure of the geometric grid, Flynn finds a way out. The promise of liberation glimpsed in his escape is rescinded somewhat by the realization that escaping the technical control of protocol only leads to another protocological construct. Mostly, however, the light cycle sequence reminds viewers of the speed that characterizes contemporary road movies, the speed that provides a sense of transcending scale, the speed that momentarily releases identity from technicity even as it fuses the two. Ultimately, there is no escaping the rules of the road, and, as witnessed by the conclusion of *TRON*, the liberation found in a road movie is a compromised freedom at best, a communicative freedom that owes its potential to reactionary technical standards. Most road movie scholarship focuses intently on the speed of mechanized transport—cars, trucks, motorcycles—and its delirious phenomenological effect: the road movie liberates by obliterating, the motor outpaces the material forms of constraint and frees the body from itself, as imaginary exile, unconscious invocation of a pop culture icon, or cyberspace avatar. But whatever the road movie promises, the reality is that you can only go where protocol will allow. No map is required.

For many young people, the racing video game has replaced the road movie and VR film as the defining protocological experience. Game franchises such as *Gran Turismo*, *Forza Motorsport*, *Need for Speed*, *Burnout*, and countless others have proliferated into multiple subgenres. Psychological studies suggest a "racing-game effect," the notion that playing racing games "can trigger risk-supportive cognitions and emotions" and thus increase "risk-taking behavior, both within and beyond the driving context."[83] Correlations have been established between the tens of thousands of illegal street-racing incidents in California alone and playing racing video games.[84] The study of road movie and VR genre films should consider whether video games, in their frequent attempts to approach realistic physics with game play, might be sources of imagining *metatechnical possibilities* for the reactionary technicities of industrial life, hopefully possibilities more liberatory than street racing. Such metatechnical possibilities, as Jeremy Packer reminds us, should be aligned with communication and transportation mobilities:

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> What I want to call for, then, is a renewed importance placed upon the function of transportation as a cultural and communicative practice that defines relationships between the two as complicit. The two need to be thought of in the same terms, especially with the increasingly mobile capabilities of nearly all communications technologies. At the same time, transportation and the forms of mobility produced by its various modes need to be analyzed as key sites of culture and communication. Struggles over mobility and access thus need to be examined in both the virtual and the material realms. Many of the debates over the control of these networks of mobility follow the same logic.[85]

As digital communications become mobile and globally networked, the projection of protocol enters new habits, spaces, and logics. Simultaneously, the depletion of resources globally, especially oil, may foreshadow a generation whose primary experience of the road is in the form of a game.

The Existential Road Movie

Perhaps the subgenre that best elicits a sense of the materiality of the road is the existential road movie, which includes *Two-Lane Blacktop* (1971), *Vanishing Point* (1971), *Dirty Mary, Crazy Larry* (1974), and others. In this subgenre, characters are not so much in transit as they are in transition; drivers are what they are. The setting shifts from inside a car to the pumps at a gas station, a table at a roadside restaurant, or the occasional drag race. Often these films have minimal plot and characters with Brechtian designations such as The Driver or The Mechanic. While the road is foregrounded as more than simply a quotidian presence, the type of *gearhead nihilism* that propels these narratives typically includes a blindness to certain inequalities of the paved paradigm; in particular, existential road movies tend to efface the racist and classist historical and material alignments of the highways on which their white heroes ride. Even a film such as *Easy Rider*, which exhibits bigotry of the Deep South, invokes the experiences of two white hippies who "head out on the highway" as emblematic of American crises of the late sixties, a limited focal point especially for a film in which infrastructure plays such a central role. The classics of this subgenre were produced in the immediate aftermath of interstate highway construction and "urban renewal" programs that overwhelmingly and negatively impacted the poor and people of color, the outcome of which included urban riots in major cities such as Detroit, Chicago, Newark, and Washington, D.C.

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in the late 1960s. Existential road movies register very little of this massive infrastructural displacement and segregation of largely black and poor communities. By foregrounding white nihilism, these films ignore the fact that "the battle against the freeway juggernaut for the soul of the American city was also a new chapter in the nation's history of racial conflict, a chapter where Jim Crow stepped behind the curtain and emerged in a new guise: infrastructure."[86] Transportation racism shifted resources to the suburbs, allowed urban transit programs to decline, and constructed forms of automobility that would disadvantage communities of color by subjecting them to most of the toxic legacies of the interstate system.[87] In other words, while classic road movies occasionally foreground the materiality of the road, they typically do so by erasing the sociohistorical circumstances of its construction and instead articulating what Jason Henderson calls the "essentialization of automobility,"[88] as something inevitable into which the antihero abandons himself and his hope for the future. If roads are seen as "a universal given"[89] and not as sites of struggle, then those who master the road can only embody its contours of hegemony in a race toward oblivion.[90]

In *Two-Lane Blacktop*, for example, The Driver, The Mechanic, and The Girl are drifting across America looking for drag racing competition when they cross paths with GTO, a talkative yuppie and former TV producer in cashmere sweaters so enthralled with his new direction in life—driving a fast car—that he bores his hitchhiking passengers into catching a ride with someone else. Eventually and reluctantly, The Girl sets off with GTO. While she sleeps in the passenger seat of his car, GTO speaks desperately of the life he imagines them sharing:

> We're gonna go to Florida. And we're gonna lie around that beach, and we're just gonna get healthy. Let all the scars heal. Maybe we'll run over to Arizona. The nights are warm, and the roads are straight. And we'll build a house. Yeah, we'll build a house. 'Cause if I'm not grounded pretty soon, I'm gonna go into orbit.

Florida might be an arbitrary southern destination for GTO's fantasy, but it is a destination particularly emblematic of the infrastructural Jim Crow emerging in the postwar United States. N. D. B. Connolly begins his book *A World More Concrete* with a portrait of "one of America's first underexpressway parks" being opened in July 1969 beneath Interstate 95 in Miami's Central Negro District.[91] The interstate had displaced houses

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and apartments, and with the construction of a playground underneath the interstate the "future of black Miami looked up at a concrete sky."[92] Connolly describes the postwar infrastructural brutalization of oppressed communities as "investments in racial apartheid, largely in an effort to govern growing cities and to unleash the value of land as real estate."[93] The modern infrastructure of American white supremacy, which began in the late nineteenth century, extended into the 1960s.[94]

> Even before the end of World War II, it remained clear that infrastructural power would mostly protect and extend the reach and longevity of white power. . . . Infrastructural power over real estate, in particular, proved instrumental to maintaining the racial peace, to holding the color line, and to monitoring South Florida's, and indeed America's, economic growth.[95]

When GTO dreams of Florida, he imagines a privileged white retreat. None of his dream will come to pass, of course, but GTO's fantasy of warm nights and straight roads captures the central tension of the road movie, discussed above—to be "grounded" but also freed by speed—and foregrounds the contradiction. GTO, unlike our heroes The Driver and The Mechanic, does not arrive at gearhead nihilism authentically: he buys an expensive new car, tries to impress everyone he meets with the car's particulars, and ultimately cannot overcome the bourgeois dream of settling down, being "grounded" by domesticated fantasies. GTO does not possess the "emotional alienation" favored by early seventies road movies.[96] The Driver, played by James Taylor, almost never breaks his expression of sullen stoicism, and this marker of authenticity—in addition to the fact that his car, a custom-built 1955 Chevy, is not an off-the-shelf expensive new car like GTO's—ensures that The Driver cannot survive for long in a world of grounded domestication. The film literally dissolves in the final drag race, after The Driver briefly glimpses through his driver's side window horses frolicking on a farm. The Driver knows the road is a death sentence, but he follows it anyway. In *Easy Rider*, horses were juxtaposed with motorcycles for an obvious metaphor of motorized mobility and the new nomadism; but in *Two-Lane Blacktop* the horses represent a world that The Driver has left behind, a settler ethos abandoned in favor of nihilistic drift.

The opening scene of *Vanishing Point*, another classic of the existential road movie subgenre, depicts two bulldozers being positioned in the middle of a road that runs through a small town. The locals silently observe police cars anxiously in pursuit, and next we see the road approaching town from

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the perspective of a helicopter. This is the end of the line for the driver being pursued, Kowalski, played by Barry Newman. Kowalski is a caricature of hetero white machismo—an ex-soldier, ex-cop, and former stunt driver who drives a white 1970 Dodge Challenger; he saved a woman from being raped by a fellow police officer; his romantic partner died in a surfing accident. Super Soul, the blind African DJ played by Cleavon Little, connects Kowalski to the countercultural community, but ultimately suffers a racist beating for helping Kowalski avoid the police. Super Soul's preternatural capacity to communicate with Kowalski over the radio aligns him with the racist cinema cliché of the "magical negro," a common anti-Black stereotype that glorifies racially subservient characters by endowing them with the extraordinary ability to rescue and perpetuate whiteness.[97] While Laderman considers the racist assault on Super Soul a "potent critique of white racism,"[98] the scene is diminished by Super Soul's passive position in the road movie narrative—white cops and outlaws get to drive, while the principal Black man in the story sits and observes—and by his articulation as a "magical negro," which has since the time of *Vanishing Point* become an established racist trope. If *Easy Rider* and *Two-Lane Blacktop* mourn the passing of white hippie culture post-Altamont and post-Woodstock, then *Vanishing Point* laments the passing of white libertarian individualism. Kowalski might have fans in the counterculture of the film, but his biography—ex-cop, ex-stunt driver, ex-soldier—aligns him with a rejection of institutional whiteness that does not point to affiliation or solidarity with antiracist action. Kowalski turns his back on violent forms of whiteness only to engage in a drug-fueled bet and cross-country race that ends in self-destruction. If, as Super Soul claims, Kowalski is the "last American hero to whom speed means freedom of the soul," then his annihilation posits the futility of collective resistance in the context of racist transportation policies and the new segregationist contours of post-interstate America. Kowalski's self-destruction is a privilege of whiteness that refuses collectivity, a nihilism predicated on repeated embraces of institutionalized whiteness (the military, the police) that end in disillusionment for a figure of distended machismo.

Nicolas Winding Refn's 2011 film *Drive* exploits many of the generic qualities found in *Two-Lane Blacktop* and *Vanishing Point*, while appropriating narrative elements of Walter Hill's *The Driver* (1978) through the aesthetic prism of 1980s Euro synth-pop and a neon noir filter of opening title

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fonts from *Risky Business* (1983) and *To Live and Die in L.A.* (1985). This aesthetic attempts to generate nihilistic cool from the antithetical components of eighties artifice and moody noir intensity, and Refn received the 2011 Cannes Film Festival Director Award for his efforts. Ryan Gosling plays The Driver in *Drive*, a Hollywood stunt driver who works as a getaway-car driver on the side. He makes a deal with Albert Brooks's mobster character, Bernie Rose, trying to protect the woman with whom he has fallen in love and her son. Bernie explains to The Driver that he "used to produce movies. In the '80s. Kind of like action films. Sexy stuff. One critic called them European." The reflexive dialogue positions Rose as a Refn surrogate, someone who makes violent art house pictures with an eighties aesthetic, a self-aware gesture that frames *Drive* as a postmodern road movie that layers self-referential genre critique onto the already-barren narrative mode of neon noir such as *Blade Runner* (1982), *To Live and Die in L.A.*, and *Manhunter* (1986). Neon noir is possessed of a brittleness not common to film noir, because the black-and-white existential smog of classical noir is replaced with reflective, colorful urban surfaces and high-fashion hairstyles. The sincerity of classical noir succumbs to violent vaporwave sarcasm. In addition to synth musical scores and stylized credits, neon noir often costumes characters in cutting-edge fashions instead of the nostalgic trench coats and fedoras of classic noir. The Driver wears a silver satin racing jacket with a scorpion embroidered on the back, a symbol that refers to the fable of the scorpion and the frog. The Driver cannot deny his nature, even if it means propelling himself into a void. *Drive* reproduces gearhead nihilism (The Driver actually works at a garage) and noir plotting with a visual and aural aesthetic that uses noir composition with eighties action film colors and music. The result is nostalgia as understood by a generation raised on violent video games, MTV music videos, and a climate-denying return of muscle car fetishization.[99]

The concrete channeled waterway of the Los Angeles River often features in Hollywood films as a space of automobility instead of a carrier of water: in *Terminator 2: Judgment Day* (1991), the shapeshifting T-1000 is introduced in the dry waterway driving a Freightliner truck in a high-speed pursuit of Arnold Schwarzenegger's T-800 model on a motorcycle; in *Grease* (1978), the L.A. River is the location of a famous drag race; in *To Live and Die in L.A.*, a car chase through the streets of L.A. also incorporates the

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river basin. The list of films using this location is extensive and includes *Drive*.[100] Unlike most films that use the location, however, *Drive* does not use the setting for a car chase (in this film about car chases). Instead, the concrete banks of the Los Angeles River are where The Driver, his romantic interest Irene, and her son Benicio spend an afternoon near a pond and some trees, a landscape that is real but looks artificial, located at the end of a concrete waterway. The scene is notably accompanied by the song "A Real Hero" by College, the project of French electronica musician David Grellier. This synthpop soundtrack with the refrain "A real human being / And a real hero" accentuates artifice and banal affect: it performs aural epiphany for a character incapable of change. The L.A. River basin in effect "ends" in an ironic revelation for The Driver and the existential road movie. By lingering in this liminal space, the scene reveals what gearhead nihilism usually avoids: that there is life beyond the concrete, that at some point concrete roads become organic landscapes. There is an outside to the road. Of course, The Driver will return to the road and its headlong rush into violent despair, but for a moment the film reveals urban boundaries. The scene by the pond on the L.A. waterway enacts an infrastructural transformation similar to Dorothy's Technicolor transition in *Wizard of Oz* or Flynn's transubstantiation in *TRON*: a barren world of concrete roads and aqueducts suddenly transforms into a bucolic cul-de-sac; the ontological implications of infrastructure briefly intrude in a landscape of otherwise bleak, concrete consistency. Typical of Refn, the scene functions primarily to evoke powerful emotions; plotting is secondary. In this subgenre such emotions are usually generated by car chases, not a rustic hiatus. But this is what gives the scene its protocological affect: even The Driver needs a respite from the road and its attendant nihilism.

The Postapocalyptic Road Movie: *Mad Max: Fury Road*

Simultaneous with the maturation of the road movie is the emergence of the postapocalyptic road movie. In films such as *Panic in the Year Zero!* (1962), *A Boy and His Dog* (1975), the original *Mad Max* trilogy (1979, 1982, 1985), *The Road* (2009), and *Mad Max: Fury Road* (2015), the primary transformation of automobility involves the erasure or displacement of governmentality in the wake of some catastrophic event. The postapocalyptic road

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movie typically engages viewers with a world in which the road has been destroyed, or the apparatus of automobility no longer includes the state form, or both. This subgenre often represents the right-wing libertarian perspective of a poststatist world: an existence that is at once brutal and short-lived but also somehow desirable because of the alleged freedom it contains for the individual no longer overshadowed by Leviathan. Here, once again, this infrastructure-inspired genre of film contains a tension: the appeal of the postapocalyptic road movie—the open spaces and sense of discovery that accompany the end of the megamachine—also contains within it an extremely reactionary, often white supremacist narrative of survivalist bravado. Ironically, then—but likely in support of what has thus far been argued about the road movie and governmentality—even when the infrastructural society disappears, popular cinema often cannot imagine a better world without it; that is, the road movie genre is so suffused with the fatalism of protocological control that its absence produces a longing for its return. The affective connection to roads—part of what Stephanie LeMenager calls "petromelancholia"—does not always produce the same politics in genre film, but the materiality of the road itself overshadows the liberatory potential of mobility.

The original *Mad Max* film might be the most reactionary of the postapocalytpic road movies, channeling the vigilante chic of 1974's *Death Wish* into a story about the Australian outback just a few years after a catastrophic event. Mel Gibson plays Max Rockatansky, a member of the Main Force Patrol (MFP), the only visible residue of the State. Even though Max goes rogue after his family is killed by a biker gang, the film clearly invokes nostalgia for the bourgeois order to which Max belonged when he was a cop. Indeed, as Jon Stratton reminds us, "The second orienting shot of *Mad Max* (literally orienting, for it is a road sign) points down Anarchie Road. *Mad Mad* and *Mad Max 2* utilise and reinforce the ideological understanding of the Australian environment as being inimical to civilization—by which is meant Western-orientated industrialized, capitalist society."[101] The frustration suffered by Max, and presumably by most of the viewers who enjoy the film, is based on the inability of Max and his fellow police to enforce the law, and the subsequent collapse of industrial civilization into roving gangs. Throughout the *Max* trilogy, the dissolution of social order is measured by the decay or inoperability of grid infrastructure, especially the roads:

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> In *Mad Max* (1979), set a "few years in the future" on the outskirts of a decaying city, the policeman Max battles biker gangs on Anarchie Road. In *Mad Max 2* (1982), which takes place after a devastating oil war, these asphalt roads have been replaced by dirt tracks as Max, now an embittered wanderer, comes unwillingly to the aid of a commune of desert dwellers. In the third film of the trilogy, *Mad Max Beyond Thunderdome* (1985), in which Max helps a group of feral children find their way home, even these dirt roads have disappeared into a trackless landscape of desert dunes, fertile gorges, and post-nuclear dust.[102]

While Delia Falconer argues that the disappearance of the road "represents both the road's liberation from colonial narratives of empire and its absorption into a *deregulated* postcolonial spatiality," and that theoretical narratives that privilege the "cultural logic" of the road over the possibility of "change within postmodernity"[103] are misguided, the trajectory in these films from roads dominated by biker gangs to the disappearance of roads actually mimics a very *modernist* sensibility, what Paul N. Edwards calls "a condition of *systemic vulnerability.*"[104] The principal narrative form of increasing the dramatic tension in the *Max* films is the escalating vulnerability of the road: from asphalt to dirt to dust in the wind, in the first three films. The psychological thrill of these films resides in the way they confront viewers in the infrastructural society with the "systemic vulnerability" of engineering megastructures, the fact that at some point they will break down (and, indeed, that their very functioning is what caused the catastrophic conditions in the first place). The *Max* films register the vulnerability of contemporary industrial capitalist subjects by gradually erasing the infrastructure that enables subjectivity. Central to this subjectivity, of course, is the road.

In the most recent *Max* film, *Mad Max: Fury Road*, the title belies the absence of a road structure in most of the film. The titular road connects The Citadel, a mountain of life in a postnuclear wasteland controlled by the patriarch Immortan Joe and his car-worshipping War Boys, with Gastown. While the Fury Road is the most direct access to gasoline, it is not actually important to the film except as the striation of patriarchal authority from which the film's hero, Imperator Furiosa, departs in favor of a plan to return to her birthplace, a matriarchal society she remembers as The Green Place, with The Five Wives, women enslaved by Joe to become his prized Breeders. Joe's dictatorial power emanates from his control of a water aquifer inside The Citadel, and his symbolic control of his War Boys and

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The Wretched who followed him to The Citadel implicates both patriarchal domination and automobility in the form of a death cult devoted to the V8 engine and a chrome-plated afterlife called Valhalla. As such, the depiction of authoritarian power in *Fury Road* shares many obvious connections with contemporary biopower. When the defecting Five Wives paint the message "Who killed the world?" on the wall of their prison before escaping, the question becomes rhetorical as the film articulates an obvious allegory: the world was killed by patriarchy and its technosocial apparatus (petrocapitalism and militarism). To defeat Immortan Joe, or at least to save herself and some of Joe's slaves, Furiosa must go off-road in a war rig designed to transport oil. This detour is very significant in the *Mad Max* universe, because it suggests a departure from the vengeance-seeking nihilism of the original film into an ecofeminist fable. To stay on the road would represent a repetition of the same nihilism that drove Max insane (or, allegorically: petrocapitalism cannot save the world from the disaster it created). Of course, Furiosa is not aware of Max's past; however, as symbolic figures of resistance, Max and Furiosa embody the politics of libertarianism and an essentialist form of feminism. Max would rather live as an alienated individual trapped in the madness of his personal suffering than engage with collective forms of resistance, and Furiosa prefers to save some of the women enslaved by patriarchy rather than die on the road transporting Joe's gasoline.

Postapocalytpic road movies such as *Mad Max: Fury Road* reduce the political imaginary to a matter of survival, akin to Marc Abélès's claim that capitalist globalization has produced, through the "interiorization of the neoliberal moment in the contemporary political imaginary,"[105] a turn away from the utopian thinking central to Western political thought and toward the "politics of survival," which he calls, after Reinhart Koselleck, a "new horizon of expectation."[106] Against his conception of survival, Abélès opposes the tradition of "convivance," or "living harmoniously together."[107] The postapocalyptic road movie, a subgenre of the road movie and its protocological technicity, is an expression of this "new horizon" in the contemporary political imaginary. Whereas the road movie translates features of neoliberal governmentality into forms of protocological control, the postapocalyptic road movie articulates decades of "interiorization" of the neoliberal order. As Abélès argues: "Survival is inseparable from the neoliberal structure of governmentality; in the contemporary political

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imaginary, survival expresses its biopolitical dimension."[108] Specifically, postapocalyptic road movies foreground the systemic vulnerability of the infrastructural society (and therefore infrastructural brutalism) by portraying landscapes that once were striated by industrial infrastructure. The biopolitical dimension of these films substitutes the road movie's aspirations of freedom through speed with more primitive controls over life and death: Immortan Joe, for example, controls water and oil, the most essential elements of an industrialized society. Survival trumps aspirations for a better world. Against the survivalist impulse of earlier postapocalyptic road movies, including the original *Max* films, *Fury Road* and other recent films of this subgenre, such as *The Road* (2009), depict a resurgence of convivance (in Furiosa's triumphant return to The Citadel and the new collectivity that seems to emerge) or of the possible boundaries to the politics of survival (in *The Road*, the spectre of suicide haunts their journey). Instead of framing postapocalyptic road movies as frivolous entertainments for doomers, we should consider the ways in which these films press at the boundaries of the contemporary political imaginary in a dying world that will not stop driving.

While *Fury Road* dramatizes a postindustrial landscape with familiar human agencies in the aftermath of a relatively roadless governance structure, there is another political imaginary that the road movie genre has yet to explore: the ecology of nonhuman agencies of automobility. What does the road look like from the perspective of nonhuman agencies? For this speculative epilogue, I turn to Leanne Betasamosake Simpson's poem "Road Salt," especially as it is interpreted by Deena Rymhs, and Ursula K. Le Guin's short story "Direction of the Road." "Road Salt" describes how Deer compulsively licks the road salt—indeed, "licking the road is its own humiliation"[109]—while being watched by "Aandeg," or Crow. Road movies often posit speed as a central component of modernist eschatology, but for Deer, in the words of Rymhs, "the side of the road is a place of immobilizing despair and abandonment."[110] The human analogue might be those drive-by communities both dependent on and trapped by the highways that connect disparate populations at the expense of those in between. Deer licks the road salt like an addict trapped in repetitive action, "pacing the side of the highway / waiting for rhythm to break / sweating for one more hit."[111] The poem adopts the perspective of Deer, to comment on road ecologies from a nonhuman standpoint.[112] By invoking Deer and Crow,

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characters common to Anishinaabe and Dene narratives, Simpson also situates her poem in the context of Indigenous storytelling and cosmologies, thus estranging "settler geographies and ontologies."[113] "Road Salt" narrates infrastructural brutalism in an anticolonial discourse of becoming-deer, depicting a milieu of passage that rarely captures the attention of road movie directors or protagonists.

Le Guin's story "Direction of the Road" begins with an italicized epilogue from the perspective of humans, but then becomes a story told from the viewpoint of a 132-year-old oak tree. The tree recalls being visited by humans and the gallop of horses. But most of the story deals with the arrival of the paved road and automobiles. To the tree, the first car is "some kind of loose creature" that the tree quickly deduces is "no mortal creature, bound or loose or free."[114] Rapid urbanization transforms the oak tree's environment:

> Yearly then, weekly, daily, they became commoner. They became a major feature of the local Order of Things. The road was dug up and re-metalled, widened, finished off very smooth and nasty, like a slug's trail, with no ruts, pools, rocks, flowers, or shadows on it. There used to be a lot of little loose creatures on the road. . . . Now the wise creatures took to avoiding the road, and the unwise ones got squashed. . . . I am thankful that I am an oak, and that though I may be wind-broken or uprooted, hewn or sawn, at least I cannot, under any circumstances, be squashed.[115]

The oak tree is aware of its place in the Order of Things, and occasionally thinks of escaping its "obligation" to that order.[116] Since everything in this order is animated and possesses agency, the oak tree observes a car accident in which one car tries to pass another and swerves to avoid an oncoming vehicle as "a temporary slanting of the Direction of the Road and a displacement onto the far side, the side which normally runs the other direction," and the tree admires the road for "its skill in executing such maneuvers, which must be difficult for an unliving creature, a mere making."[117] Instead of the car hitting the tree, the tree sees itself hitting the car: "The driver had no time to say anything; I killed him instantly."[118] Because the human driver does not believe the tree is animated, he dies in a moment of "false vision" in which the tree is caught "eternally."[119] "If the human creatures will not understand Relativity," mourns the tree, "very well; but they must understand Relatedness."[120] Le Guin's animism reimagines automobility and infrastructure in an ontological formation akin to distributed agency,

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a perspectival shift intended to foreground how unnatural it is for a tree to cause death; the tree thinks to itself, "For I am not death. I am life: I am mortal."[121] Indeed, the sociotechnical apparatus of automobility brings into being a collision of trees, cars, and humans that obscures the underlying "relatedness" of oak trees, apple orchards, beetles, and humans before the invention of the car and road, before the humanist caesura of ontological becoming. The road movie *to come* invites ontological wandering in a postindustrial fantasy of becoming-otherness.

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3 Agency and Energy Regimes in Ruins: The Photography of Oil Landscapes

> It is indeed no little thing to control without restriction a commodity that uncountable millions of people are dependent on.
>
> —Gustav Landauer, German anarchist, writing in *Der Sozialist* on September 9, 1895

> Empires have a way of coming to an end, leaving behind their landscapes as relics and ruins.
>
> —W. J. T. Mitchell

Infrastructural brutalism describes the historical moment when global capitalist destruction converges with global ecological crises including the Great Acceleration and the Anthropocene, and capitalism, instead of slowing the pace of its destruction, escalates its commitment to the construction of industrial infrastructure with unprecedented investment and resource consumption. One of the arguments to which I return throughout this book is that the attention given by anticapitalists to renewable energy technosocial assemblages, while important, is not as imperative as the need to disable oil capitalism before it permanently locks humanity into a near-term extinction scenario. While it is essential that alternatives to oil capitalism are constructed, the mere existence of these alternatives will not prevent oil capitalism from continuing to extract fossil fuels, produce toxic synthetics, and emit record levels of greenhouse gases. In short, what we destroy in the coming decades will be more important than what we build. An implicit assumption in most progressive or radical scenarios that foreground alternatives to oil capitalism is that oil capitalism will somehow become a responsible ecological steward of its own accord or as a result of

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government regulations. In addition to contradicting the history of capitalism, this assumption does not align with explicit contemporary capitalist ambitions. For example, according to the IMF, global fossil fuel subsidies in 2017 totaled approximately $5.7 trillion.[1] In aggregate terms, China is the largest subsidizer of fossil fuels. In 2015, the United States spent more on subsidies for the fossil fuel industry than it did on its military.[2] Globally, the state form remains profoundly committed to fossil fuel extraction and at odds with the nonbinding targets of the Paris Accord. A 2019 report from the environmentalist group Global Witness estimates commitments by global oil and gas corporations to new fossil fuel exploration at $4.9 trillion for the coming decades.[3] Global Energy Monitor estimates slightly more than half of the 302 oil and gas pipelines in development worldwide are located in North America; if these pipelines are constructed, they will increase global oil and gas pipelines by almost one-third and ensure decades of increased oil and gas extraction and consumption.[4] Oil capitalism shows no signs of slowing extraction, and even peak oil is unlikely to prevent climate catastrophe, because of the probability that a decline in oil supply will lead to the tapping of other, more dangerous fuel sources. Progressive analyses of the situation also tend to ignore geopolitical factors, such as the rise of far-right governments that typically deny the existence of global climate breakdown and eliminate existing marginal regulations on capitalist exploitation. Many progressive and radical analyses assume, explicitly or implicitly, that either market conditions will dramatically reduce the presence of fossil fuels in our energy mix (and, concomitantly, that renewables will ascend because of affordability), or that capture of the state by progressive forces will enable some kind of global regulation of fossil fuel extraction and consumption. These assumptions are incompatible with the history of state and capitalist formations, and with the momentum of existing extractive industry assets.

Photography and Oil: Petrography

As Adrian Forty notes, the French word for concrete (*béton*) derives from the same word in Old French as *bitumen*.[5] Both words etymologically originate from a "mass of rubbish in the ground." In a series of photographic experiments that began in 2012, Métis scholar and artist Warren Cariou used bitumen to recreate photography as it was originally assembled in

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the nineteenth century.[6] The so-called "first photograph" was created by Nicéphore Niépce in 1826 using "bitumen of Judea." Cariou and his collaborators retrieved bitumen from the Athabasca River in northern Alberta, location of the notorious Tar Sands, a catastrophic combination of extractive industry invention and brute force. The oil industry in Canada estimates 170 billion barrels of recoverable oil to be in the Tar Sands, and a massive and durable infrastructure has been constructed to facilitate its extraction. The recovery of bitumen, which is then refined into oil at great expense and ecological devastation, is a "temporally inflexible" process, extremely expensive to initiate and therefore persistent once commenced.[7] Troy Vettese rightly calls bitumen a "recalcitrant fuel," but one that private investors prize because it represents half of the remaining oil deposits not controlled by nation-states, and because the $250 billion invested in its development from 1999 to 2015 make the Tar Sands "the largest single industrial project *ever*."[8] As recently as the nineteenth century, Indigenous people used bitumen as part of canoe construction. Cariou retrieved some bitumen from the banks of the Athabasca to see if he could experiment with the medium of modernity: "extractive industry viewed through a film of oil."[9] The results are impressive, like X-ray images embossed on sheets of gold.

Syncrude Storage Tanks and Infrastructure (fig. 3.1) illustrates what Cariou calls "petrography." Notably, this reproduction does not capture how Cariou's petrographs react to different luminosity; the image becomes more or less visible as one changes its angle of exposure to light. Viewers of these images can often see their own reflections in a petrograph as well. Jon Gordon ascribes a disruptive quality to the reflection in the petrograph: "The way we see ourselves through the bitumen of a petrograph, one's own face reflected in the images, is a way of showing the viewers their implication in the process of development that the images depict. This disrupts the typical effect of photo-realist representation in which the viewer assumes the image shows a 'reality' out there, distant from and possessed by the viewer."[10] For Cariou, the process of making petrographs was a way of becoming more explicitly aware of ubiquitous petrocultural toxicity. While he, like many people, was aware of the many toxic consequences of a culture in which oil extraction, refining, and consumption are pervasive, it was not until he began working with bitumen as an artistic medium that he "became more viscerally aware of the risk" posed by the material.[11]

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Fig. 3.1
Warren Cariou, *Syncrude Storage Tanks and Infrastructure*, 2014. © Warren Cariou, 2014.

Contrary to expectation, Cariou's encounter with bitumen as an artistic medium made the substance more ambiguous to him; he considered the role capitalist modernity played in transforming this naturally occurring substance into something toxic and part of the climate change catastrophe. Cariou compares bitumen to the history of tobacco, "which has a sacred spiritual value for many Indigenous people, but when transformed in the machinery of capitalist modernity, it becomes a harmful, toxic, addictive substance."[12] How, asks Cariou, can we "establish a different relationship with [bitumen], one that is more respectful of its power for destruction as well as its potential for creation"?[13]

The "different relationship" of which Cariou speaks will require a dramatic global social transformation, given how deeply entrenched oil capitalism remains, and even if such a relationship were achieved we would still encounter the remnants of oil capitalism in abandoned infrastructure, catastrophic climate change, and massive biodiversity loss for hundreds or thousands of years. Until the past ten years, much academic social theory ignored the centrality of oil, or of "energy" more generally, to the constitution of

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capitalist social relations. Allan Stoekl, for example, describes the "occlusion of energy as a source of value" in Hardt and Negri's post-Marxist bestseller *Empire* as "remarkable."[14] During the past decade—inspired by a combination of peak oil discourse, the US invasions of Afghanistan and Iraq, and growing awareness of the unfolding climate catastrophe—some social theorists have returned to considerations of the particular dynamics that structure social assemblages and the dominant energy regimes; much of this research is articulated in the emerging literature of "petrocultures."[15] In the introduction to their recent anthology *Oil Culture*, which features many prominent scholars in the field of petrocultures, Barrett and Worden summarize the primary cultural objects investigated by scholars in the field: "As we envision it, then, oil culture encompasses the fundamental semiotic processes by which oil is imbued with value within petrocapitalism, the promotional discourses that circulate through the material networks of the oil economy, the symbolic forms that rearrange daily experience around oil-bound ways of life, and the many creative expressions of ambivalence about, and resistance to, oil that have greeted the expansion of oil capitalism."[16] Christopher F. Jones has critiqued the emphasis on oil in energy humanities to the exclusion of other energy topics, what he calls "petromyopia," and though the following chapter focuses on oil, it is worth considering Jones's critique. As very important as oil is to the constitution of the current form of capitalism (below I will continue to use terms such as "oil capitalism" and "petromodernity," to indicate an object of study and not a universalization of fossil fuel dominance), Jones argues that "coal has been a more transformative fossil fuel, food has been the single most essential energy source for human history, and electricity constitutes the most commonly used form of energy for those living in developed nations."[17] The heterogeneous energy assemblage worldwide has significant implications for the study and transformation of infrastructure, for example. Oil is not the primary source of electricity in most parts of the world, which means structural differences for electricity consumption: "in critical ways, the social consequences of electricity diverge from those of oil, as the systems involve a different cast of companies (regional *versus* multinational corporations), regulatory patterns (state-level utility commissions *versus* national and international regimes), infrastructures (grid *versus* tankers and pipelines), markets (regulated monopolies *versus* international markets), and consumption patterns (appliances *versus* transportation)."[18] Jones

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provides several substantive critiques of the study of petrocultures, and his conclusions deserve consideration by infrastructure scholars; in particular, his advocacy for a shift from foregrounding fuel to a more diverse scholarship of energy sources, especially electricity, might correspond with a shift from the festishization of oil to a concern for the structural transmission of energy in infrastructural forms. For this chapter, oil capitalism is the focus because of the significant role it plays in environmental devastation (global climate change and plastics especially), indexed by the photographs under consideration.

Energy regimes produce affordances and constraints for social actors, specific assemblages of labor, communications, transport, and consumption. When those energy regimes diminish or collapse, and even in their normal functioning, they leave behind ruins—what Gastón R. Gordillo calls the "ruptured multiplicity that is constitutive of all geographies as they are produced, destroyed, and remade"[19]—some of which can be salvaged for continuing human use, some of which can be retrofitted or upgraded for the new energy regimes, and some of which either have no use or must be destroyed. For Gordillo, the concept of "rubble" is "a concept of both theoretical and political importance because it deglamorizes ruins by revealing the material sedimentation of destruction."[20] Oil capitalism tries to conceal its destruction and sedimentary residue, by the proliferation of propaganda (to obscure resource wars, the violence of extractive industries, etc.) and the valorization of "creative destruction" as a progressive element of capitalism. The ruins of oil capitalism—desert countries reduced to rubble, pockmarked and impassable paved roads, abandoned oil rigs, impoverished and toxic human bodies, nonhuman animal carcasses processed by mechanized slaughterhouses—are often made invisible by their pedestrian presence and the glaring confusion of the spectacle, but artistic media such as photography, television, and film can help us to see the "ruptured multiplicity," the "processes of *ruination*"[21] that oil capitalism makes and remakes, all while durable infrastructure assemblages shroud the ubiquitous ruination with a sense of structural continuity and benevolence. Oil capitalism also faces another ruinous reality: oil infrastructure is functionally extinct. Oil capitalism is no longer compatible with life on earth, in its current scale and with its accumulation of emissions and wreckages. As Roy Scranton says, industrial civilization is "already dead."[22] To witness the ruination of oil capitalism therefore incorporates multiple temporalities: ruins past, present, and

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future. The images examined below include energy regime materialities of varying ruinations: abandoned oil wells that have stopped extracting but whose byproduct has inevitably been burned or used to produce plastics that will contaminate the environment for centuries; oil refineries that seem frozen in time in the image, but which continue to be an active component in the production of gasoline, petroleum coke, asphalt, and other petroleum products; coal power plants (the most pollutive of the fossil fuels) that evoke not only the ruins of airborne particulates appropriately named "fugitive coal dust" but also the entire assemblage of black lung, acid rain, cancer, smog, and mercury and other heavy metal contamination. How will we process the visualization of the ruins of modernity: in mourning for the beauty and diversity of life that has been lost and cannot be revived, or as resilient combatants against a suicidal regime determined to kill most life on earth? Gordillo wisely reminds us that destroyed "sites of power" make "people less fearful of the powerful";[23] ruins can be a source of inspiration. Gordillo calls this the "core of the elite fear of rubble in moments of unrest: that the rubble, indeed, could be an invitation to remake the world differently."[24] The rubble can also be fetishized in dangerous ways that accommodate people to gentrification and war, forms of violence that advantage the death spiral of capitalism. In what follows, images of oil capitalism are considered for their depictions of agency among the ruins.

The New Topographics

The New Topographics movement in photography—made famous by the exhibition "New Topographics: Photographs of a Man-Altered Landscape" at the International Museum of Photography at George Eastman House in Rochester, New York in October 1975—broke with the traditional landscape photography of Ansel Adams and Eliot Porter to frame the postwar industrialization of America in aesthetic terms "marked by repetition and isolation," the disappearance of community "in an atmosphere of vacant alienation" defined by suburban sprawl, and a "celebration of directness, emotional remove, and attentiveness to humanity's shaping of the land."[25] Curator William Jenkins included in the famous exhibit (reproduced in 2009) photographers Robert Adams, Lewis Baltz, Bernd and Hilla Becher, Joe Deal, Frank Gohlke, Nicholas Nixon, John Schott, Stephen Shore, and Henry Wessel, Jr. Decades after the seminal exhibit, the New Topographics

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aesthetic remains relevant and is being reassessed by scholars; in the summer of 2011, for example, the exhibition "Public Works" at the Museum of Contemporary Photography in Chicago examined contemporary built infrastructure. Above all, and perhaps concomitant with post-1968 cultural theorists who emphasized the micropolitics of everyday life, the New Topographics photographers demonstrated an appreciation for "the altered environments of daily life," something Finis Dunaway sees as "contributing to ecological citizenship by encouraging viewers to form attachments to a broader continuum of sites."[26]

Contrary to earlier forms of landscape photography that situated nature as pristine and untouched by human development, the New Topographics engaged American landscapes as the scarred and decaying byproducts of capitalist exploitation, often featuring vacant spaces for automobility such as parking lots, highways, or gas stations, as in the work of Robert Adams, indicating "the new West's utter dependence upon petroleum and private transportation."[27] The Rochester exhibition's "juxtaposition of abandoned, new, and incomplete structures instills the human-altered landscape with a sense of built-in obsolescence and distinguishes its rapid growth from the natural environment in which it is situated."[28] Whether borrowing aesthetic inspiration from commercial real estate photography[29] or aerial photography,[30] the New Topographics was a photographic style commonly interpreted as apolitical, due to its "flatness, dehumanization, and deception of scale."[31] The same complaint has been levied against Canadian photographer Edward Burtynsky, whose manufactured landscapes seem to avoid explicit commentary on the industrial alterations they depict and often seem to beautify industrial waste and ecological devastation.

In her review of Jennifer Baichwal's film about Burtynsky's work, *Manufactured Landscapes*, Nadia Bozak writes, "Because Burtynsky systematically aestheticizes industrial civilization's environmental incursions, his images are marked with an almost insentient detachment and lack of critical positioning that can be troubling."[32] To this point, Jonathan Bordo asks, "Does such beautification sooth irremediable loss by making human interventions appear like inevitable natural facts?"[33] This essential tension between ecological catastrophe and aesthetic beauty becomes the central dilemma for most viewers of Burtynsky's photographs, what Bordo characterizes as "an ambiguous situation of pondering pictures of ecological devastation while beholding dazzling visual surfaces."[34] Burtynsky's aesthetic and the

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New Topographic aesthetic from which it derives should not be seen as apolitical, but rather as traces of an empire in ruins and a sociality to come; that is, Burtynsky's photographs in his collection *Oil*, and Mitch Epstein's images from *American Power*, produce an aesthetic of what Yves Abrioux calls "intensive landscaping," or "landscaping as style, as the promise of a social spacing yet to come."[35] What Burtynsky and Epstein accomplish in their photographs related to energy in particular is "to invent relations, rather than assert ideological or cultural control."[36] In Burtynsky specifically, the place of energy extraction and transport becomes not a self-contained striation of ecological degradation but a "place of passage," to use Deleuze and Guattari's terminology, a depiction of wildness and civilization in contact, assembled and reformulating the landscape into something other. Burtynsky himself described the ambivalence of his images: "I think that's the duality. I think that's what makes the images unstable. I think that's what makes them interesting that they're not kind of used as indictments. . . . Their meaning is not fixed."[37]

It is obvious to observers of Burtynsky's photographs that they catalogue ecological devastation. What is often perceived as a beautification of this devastation might also be considered a rhizomatic depiction of an always-incomplete process of becoming postempire, postcapital, and postnatural; the industrial revolution, after all, "fuelled by coal, oil and gas has resulted in a level of landscape change that is—in both its nature and magnitude—unprecedented in the history of humankind."[38] The ambivalence provoked by these photos signifies the death of conventional landscape photography and its ossified understanding of nature as a static, pristine construct, a representational form passing into something else. Burtynsky and Epstein depict an associationalism in place of state modalities of capture and striation, while foregrounding the energy relationships that shape landscapes as the sun sets on the suicidal state.

What is especially compelling about Burtynsky's vision of state capture and striation is that it perceives this passage from the "distant vision" of a state, unlike some "environmentalist" framing of ecological devastation that sees "apparatuses of capture" from the vantage of what Deleuze and Guattari call the "close-range" vision of smooth space.[39] That is, Burtynsky's photographs see state modalities "like a state," like the cadastral maps that produced the "synoptic view of the state,"[40] and this perspective is unnerving for many viewers, especially those who do not identify with the optical

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space of the state. Absent are the intimate portraits of oil-soaked birds, dislocated Indigenous communities, or tattered corpses that normally signify, in the visual register of the social justice jeremiad, the criminal machinations of Big Oil. Instead of witnessing industrial evisceration from the intimate space of the indignant observer, Burtynsky complicates the observer's relationship to agency in the age of oil by foregrounding the scale, technological complexity, and almost mythical ubiquity of petroculture. Absent is the bilateralism of earnest environmental portraiture, the simplistic agential dualism that pits "people" against Big Oil. Instead, Burtynsky offers a vision of a distributed agency, in which the "unstable cascade"[41] of intentionalities resists a linear cause and effect in favor of depicting objects produced by flows of energy, material combinations, and "the conjoined effect of a variety of kinds of bodies,"[42] an ontological reality that seems particularly noteworthy for industrial nations built on vast and complex technological infrastructures with extensive historical, political, and environmental legacies.

State Infrastructure

The modern state form coevolved with the material capacities of infrastructure, massive hydraulic processes that could generate and transfer electricity, excavate waste, and couple mobility with communication. "Between 1880 and 1950 modern nation states emerged as great territorial 'containers' with growing powers over many domains," note Graham and Marvin.[43] Within this context, infrastructure was widely perceived as the cohesive assemblage for a sense of national identity, and "infrastructure policies were the central way in which national states engaged in shaping capitalist territorial organization."[44] Some of the most notable infrastructure projects of this period include "the Nazis' *Autobahn* network, the electrification of the Ukraine and the Soviet Union, the New Deal regional projects of the Tennessee Valley and the national highway programme in the United States."[45] These historical touchstones conform to Deleuze and Guattari's definition of state territorialization:

> One of the fundamental tasks of the State is to striate the space over which it reigns, or to utilize smooth spaces as a means of communication in the service of striated space. It is a vital concern of every State not only to vanquish nomadism but to control migrations and, more generally, to establish a zone of rights over

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> an entire "exterior," over all the flows traversing the ecumenon. If it can help it, the State does not dissociate itself from a process of capture of flows of all kinds, populations, commodities or commerce, money or capital, etc. There is still a need for fixed paths in well-defined directions, which restrict speed, regulate circulation, relativize movement, and measure in detail the relative movements of subjects and objects.[46]

James C. Scott traces this striation of space in early modern Europe primarily in the form of cadastral maps used for the segregation and taxation of land, among other state functions, in his book *Seeing Like a State*. Beginning with German scientific forestry, in which the "uniform forest was intended to facilitate management and extraction,"[47] Scott demonstrates the translation of the state's synoptic vision from forestry to other forms of striation including taxation. For the purposes of taxation and conscription, and in conjunction with the emergence of the modern state, cadastral maps translated the complexity of phenomenal flows into simplistic abstractions, becoming, to use Mark Halsey's phrase from another context, "a machine of axiomisation," something that "expunges the world of pre-formed things . . . the world composed only of rhythms and of bodies without organs, and in its place substitutes the certainties of Royal science and (il) logics of capital."[48] Scott writes:

> The crowning artifact of this almighty simplification is the cadastral map. Created by trained surveyors and mapped to a given scale, the cadastral map is a more or less complete and accurate survey of all landholdings. . . . The cadastral map and property register are to the taxation of land as the maps of tables of the scientific forester were to the fiscal exploitation of the forest.[49]

The cadastral map, this "machine of axiomisation" or modality of state capture, not only "ignored anything lying outside its sharply defined field of vision,"[50] it also produced a specific aesthetic: "The visual sign of the well-managed forest, in Germany and in the many settings where German scientific forestry took hold, came to be the regularity and neatness of its appearance."[51] Similar to the symmetry and synthetic appearance of the managed forest, landscapes under the synoptic vision of cadastral maps exhibit a quilted calculus primarily visible from an elevated vantage, "a God's-eye view, or the view of an absolute ruler."[52] The reconstruction of Paris by Baron Haussmann from 1853 to 1869 exhibited the same logic as the scientific management of old-growth forests, and in the city "the aboveground order . . . facilitates its underground order in the layout of

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water pipes, storm drains, sewers, electric cables, natural gas lines, and subways—an order no less important to the administration of a city."[53] Thus, submersed infrastructure functions as a supplementary force of relations with "aboveground" striations, the repressed material strata of the *flanêur*.

Edward Burtynsky's *Oil*

> I began to think about oil itself: as both the source of energy that makes everything possible, and as a source of dread, for its ongoing endangerment of our habitat.[54]
>
> —Edward Burtynsky, *Oil*

"The cadastral map is very much like a still photograph of the current in a river," writes Scott,[55] using a simile that effectively expresses the paradox of Burtynsky's photography about oil. The cadastral map captures innumerable social processes in a state of becoming and occludes their very transitive properties for the administrative logic of the state. Burtynsky's photographs often provide a sense of stasis where enormous sociotechnical apparatuses are operating in conjunctural tension. A perfect example of this is *Oil Fields #22* (fig. 3.2), taken near Cold Lake, Alberta. This image, which opens his *Oil* collection, captures pipelines parsing a forest in a nondescript patch of wilderness. The pipelines travel from outside the left frame to beyond the horizon near the center of the image, in a winding path that evokes the natural contours of a river rather than the mechanical trajectory of something constructed. And yet this river of oil is still, the trees are erect as if there is no wind, and, typical of Burtynsky and the New Topographics, no human activity is visible. This image of the pipeline as pristine and autonomous conforms to what Graeme Macdonald calls "an oil-reliant capitalism seeking to extend and perpetuate supply while downplaying the ongoing, exploitative shame of extraction and land dispossession and the inevitable endpoints of burning."[56] Despite the obvious impact on the forest in the photograph, one could easily imagine Burtynsky's *Oil Fields #22* receiving the approval of the oil industry; the depiction of technical and natural elegance defers consideration of where the oil comes from and where and how it is ultimately used. The image belies the reality of oil

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Fig. 3.2
Edward Burtynsky, *Oil Fields #22*, Cold Lake, Alberta, Canada, 2001. © Edward Burtynsky, courtesy Paul Kuhn Gallery, Calgary / Metivier Gallery, Toronto.

pipelines in Alberta, which averaged two oil spills per day from 1975 to 2012; that's 28,666 crude oil spills, and that does not include spills from pipelines that cross provincial or national borders.[57] According to a 2016 estimate from the Alberta Energy Regulator, it will cost $22.75 billion to clean up the tailings—the toxic refuse from oilsands extraction—which totaled 1.13 billion cubic meters as of 2015.[58] A report from Environmental Defence and the Natural Resources Defense Council estimates the cleanup cost for the tailings ponds at $44.5 billion, a figure that does not include additional expenses related to land reclamation and water monitoring.[59] The cost of the cleanup already exceeds the amount of royalties collected by the province between 1970 and 2016.[60] And the estimated 343,000 oil wells in Alberta could take more than 2,800 years to clean up, a process the Alberta Energy Regulator estimated in 2019 will ultimately cost $260 billion.[61] These figures, likely a fraction of the actual damage the tar sands will

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produce once the oil companies are finished and leave, represent only part of the destruction to northern Alberta, and if the history of Big Oil is any indication the task and expense of trying to clean up the mess left by the oil industry in Alberta will fall almost entirely on public institutions. The stasis of the oil delivery apparatus and its riverlike curvature in *Oil Fields #22* connote ambivalence about *what is really happening*, an ambivalence registered above by the reviewers of Burtynsky's work. One could note, for example, that the more than 370,000 kilometers of pipelines in Alberta present a number of significant threats to the provincial environment: potential contamination of land and water from spills; loss and fragmentation of wildlife habitat and natural vegetation; loss and compaction of soils; reduced availability of agricultural, prairie, and forested areas; loss of historical resources such as archaeological sites; and stream sedimentation.[62] At the same time, oil is implicated in a host of social benefits (medical advances, certain forms of mobility, warmth, agricultural production, etc.) and devastation (militarism, pollution, toxification of water and soil, agriculture—again, etc.), and complex, distributed forms of agency make it difficult to create a binary division of sinners and saints, malevolent demand and benevolent supply, those who are solely responsible for the petrocultural apparatus and those who stand entirely outside of it. Most notably absent from Burtynsky's oil images, and yet most aggressively affected by capitalist resource extraction, are the First Nations communities of Alberta. This absence contributes to the ambivalent tone of his photographs, by visually displacing the most obviously aggrieved subjects of oil capitalism; their presence would make it easier for viewers to identify a political trajectory of accusation. But such a trajectory would also ignore the distribution of complicity with the atrocities of oil capitalism. By expanding our understanding of distributed human and nonhuman agencies in "petromodernity,"[63] we can better recognize the shifting intensities of petrocultural assemblages.

In other words, if Burtynsky's *Oil Fields #22* is considered as synecdoche for the oil industry in its entirety, then clearly it conceals what Graeme Macdonald calls "the disastrous nature of oil's benevolent banality";[64] similarly, Christopher F. Jones describes pipelines as a "dissociating technology," because they tend to operate away from the view of the consumers they serve, thus making it easier for industrial subjects to ignore the consequences of their energy use.[65] The theoretical lens of the ruin, on the other hand, or rather Ann Laura Stoler's emphasis on *ruination*—"an active,

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ongoing process that allocates imperial debris differentially"[66]—provides a heuristic for oil photography that recognizes images of oil capitalism as representations of an energy regime becoming ruins; the pipelines that define this imperial formation are monuments "to what remains blocking livelihoods and health, to the aftershocks of imperial assault, to the social afterlife of structures, sensibilities, and things."[67] *Oil Fields #22* portrays a stage in the dispossession of Indigenous territory, the polluting of the air, the evisceration of ecosystems, the enrichment of ecocidal capitalists, the enabling of state war machines, the powering of resource wars, the death and impoverishment of foreign populations. One question that must be asked regarding the energy regime to come is the question Stoler asks of "imperial debris": "how do imperial formations persist in their material debris, in ruined landscapes and through the social ruination of people's lives?"[68] Whatever energy regime replaces oil capitalism, it will have to deal with the material, ecological, and social ruination produced by oil capitalism.

The juxtaposition of the forest and the pipelines in *Oil Fields #22* recalls what Deleuze and Guattari famously described as the rhizomatic multiplicity that they contrasted with the hierarchical structure of the tree, associated with what they called arborescent thought—"thought, which like a tree, judges the world from one fixed point (roots, Cartesian rationality), or requires that thinking proceed in only one direction (scientifically, dialectically)."[69] Burtynsky's collection *Oil* thus begins with an image of trees, a metaphor used by Deleuze and Guattari to describe arborescent thought. However, the structure of the pipeline system has also been compared with a tree:

> The pipeline system is organized like a tree. Small collector pipelines in the oil field, called flow lines, are the fine roots of the system. They gather crude oil from many wells and bring it to the field processing station. Somewhat larger pipes carry the oil to the terminus of a main-line pipeline, which supplies refineries hundreds of miles away; this is the trunk of the tree. The products of the refinery are then distributed through another system of main-line pipes, which divide into smaller and smaller branches until they reach distribution depots—the leaves of the tree.[70]

The entire apparatus of oil extraction, refinement, and distribution perfectly encapsulates the hydraulic science of the state, its hierarchical, arborescent thought that captures flows in a constant struggle with rhizomatic,

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Fig. 3.3
Edward Burtynsky, *Oil Fields #19a*, Belridge, California, USA, 2003. © Edward Burtynsky, courtesy Paul Kuhn Gallery, Calgary / Metivier Gallery, Toronto.

open multiplicities. Burtynsky's *Oil* begins not with an image of oil extraction or combustion, but with an image of trees and a treelike system of pipelines, the image of Royal science, arborescent thought.

The rows of "nodding donkey" oil wells in Belridge, California, depicted from an oblique angle in Burtynsky's *Oil Fields #19a* (fig. 3.3), could easily be mistaken for an abandoned oil patch, if not for the two devices in the foreground visibly blurred because they are operating. Much like the pipelines in *Oil Fields #22*, the wells depicted in *Oil Fields #19a* encode the ambiguous agencies of modern industrial infrastructure. The oblique angle separates the image from the conventional geometry of the cadastral map, but only the two wells in the foreground appear to be moving. No humans are visible. Is this a dried-up oil patch, or the beating heart of the industrial society? Burtynsky allows the viewer to contemplate the space of passage between the two, between the dying empire and the vision of sociality

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to come, by isolating the materiality of petroculture from a detached and distant perspective. Instead of bisecting a forest, which might commonly connote forms of biodiversity, the wells depicted here are in the desert, a landscape frequently associated with hostility to life and, in the context of oil, with the crude oil deposits of the Middle East. Perhaps Burtynsky's purpose with this image is to disorient the American viewer, with a landscape that could be either California or Iraq? A combination of elements in this image suggests psychological tension and alienation: the oblique angle, god's-eye view, desert setting, and absence of human activity. Burtynsky's familiar use of the horizon intimates a mythological scale of production. But where are the people who use the oil, and to what ends do they use it? Is this particular striation of oil wells and transformers, pipes and storage tanks, the beginning or the end of agency, the source of combustible mobility, long distance communication, and petroleum-based cultural products, or the mechanical moans and sighs of an empire reaching exhaustion? Burtynsky does not tell us. Will these ruins of oil capitalism have any functionality in the energy regime to come? It is difficult to say, but probably not. Burtynsky described this picture to the CBC in terms that reflect the associationalist perspective discussed here: "It's a mosquito drawing blood. It's like we have these pipes into the ground sucking it out and we never really get a chance to see very much of the material itself, but each one of us is almost using it every day."[71] The metaphorical connection between pump jacks and the drawing of blood is reminiscent of Any Lily Amirpour's 2014 film *A Girl Walks Home Alone at Night*, which juxtaposes the ubiquitous pump jacks that surround the fictional ghost town of Bad City with the vampire at the center of the story. Extraction does not always produce life; sometimes it simply perpetuates an undead civilization, and always there are necropolitical consequences, the dictate that some or many must die.

To understand the materiality of agency in Burtynsky's photography, one can summon the observations of the "new materialisms" of political theorists such as Jane Bennett, Diana Coole, and Timothy W. Luke, and of critical urbanists including Stephen Graham and Simon Marvin. Prominent strands of materialist cultural studies and urban studies employ the concept of "assemblage"[72] to understand the distributed agency of urban infrastructure, which is often obscured either by its relative invisibility or by the anthropocentrism of cultural theory. Jane Bennett reminds us, "There was never a time when human agency was anything other than an interfolding

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network of humanity and nonhumanity. What is perhaps different today is that the higher degree of infrastructural and technological complexity has rendered this harder to deny."[73] Oil pipeline or well assemblages, in this context, should not be studied as just the material product of oil company intentions, nor should their construction be understood as either the victory of an oil company or the loss of community resistance (the popular media framing of pipeline debates). Rather, cultural critics need to examine the "unstable cascade"[74] of intentionalities, flows of energy, material combinations, and "the conjoined effect of a variety of kinds of bodies"[75] that are contained within the mass structures of petrocultural landscapes. Assessing the distributed agency of petrocultural assemblages is not an act of becoming an apologist for environmental degradation or colonial racism, but instead recognizes that individuals are "simply incapable of bearing *full* responsibility for their effects."[76] Burtynsky's photography is particularly useful for encouraging a discussion of agency in this manner.

Oil pipelines are but one aspect of oil extraction, transport, and use, but they connect the environmental, cultural, and health impacts of oil exploration, drilling, and extraction with the assemblages of oil transport, refining, and consumption. The spillage of oil is not always the most devastating effect of this process: "The physical alteration of environments from exploration, drilling, and extraction can be greater than from a large oil spill."[77] Oil refineries, such as the one in Texas depicted in Burtynsky's *Oil Refineries #34* (fig. 3.4), "produce huge volumes of air, water, solid, and hazardous waste, including toxic substances such as benzene, heavy metals, hydrogen sulfide, acid gases, mercury, and dioxin."[78] The oil and gas industry in the United States creates more solid and liquid waste "than all other categories of municipal, agricultural, mining, and industrial wastes combined."[79] The transport of oil from its place of extraction occurs by supertankers, barges, trucks, and pipelines; there are now "more miles of oil pipelines in the world than railroads."[80] Typically, these pipelines have "caused disproportionate impacts on low-income and minority communities in the United States and been connected to human rights violations around the world."[81] In other words, perhaps we could view what often lies within Burtynsky's frame as an invitation to contemplate the many associations beyond the frame; in the case of his photographs about oil, the pipelines, wells, and refineries represent passages, associations, transfers of energy beyond the frame. Burtynsky's images do not neglect social,

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Fig. 3.4
Edward Burtynsky, *Oil Refineries #34*, Houston, Texas, USA, 2004. © Edward Burtynsky, courtesy Paul Kuhn Gallery, Calgary / Metivier Gallery, Toronto.

psychological, and environmental devastation so much as they invite consideration of an agency that is multiple and beyond arborescent capture.

Therefore, when we see an image such as *Highway #5* (fig. 3.5), we might see in this image an aesthetic parallel with *Oil Fields #22*. In *Highway #5*, tributary lanes of traffic converge into a river of asphalt that extends to the horizon in a seemingly endless bisection of the frame and the built landscape. Like the pipelines in *Oil Fields #22*, the highway bends casually as it drifts toward the horizon; this curvature, a feature of undomesticated objects, contrasts with the cadastral strips of habitation on either side. In the foreground is a highway that runs parallel with the frame, and in the background lie rolling hills. While the foreground and background portray conventional contrasts of striated and smooth space, the center of the image features a provocative strip of highway that destabilizes our topographic expectations. The horizon once again gives the impression that

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Fig. 3.5
Edward Burtynsky, *Highway #5*, Los Angeles, California, USA, 2009. © Edward Burtynsky, courtesy Paul Kuhn Gallery, Calgary / Metivier Gallery, Toronto.

the built landscape continues forever, the hills standing like phantasms on the edge of a dream (or nightmare). Reyner Banham, whose 1955 essay and 1966 book on the "New Brutalism" were foundational documents in the understanding of architectural brutalism, famously wrote a love letter to Los Angeles in which he called the Los Angeles freeway "one of the greater works of man."[82] Decades later, Los Angeles has several of the worst highway bottlenecks in the United States,[83] the Auto Insurance Center calls the 101 freeway the worst commute in the country,[84] and the 1.2 million people who live within 500 feet of a southern California freeway "suffer higher rates of asthma, heart attacks, strokes, lung cancer and preterm births. Recent research has added more health risks to the list, including childhood obesity, autism and dementia."[85] Burtynsky's image offers little recognition of this reality. Instead, similar to *Oil Fields #22*, *Highway #5* seems to decontaminate the typical scene of industrial congestion and pollution.

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Burtynsky's *Oil* collection is organized to emphasize the ubiquity of oil and the distribution of agency. It is telling that the image of a pipeline opens the collection, and not an image of the point of extraction, refinement, or use; this is a collection about the places of passage. Without that epigraphic image of the pipeline, the rest of the collection would unfold in a more conventional way: the section titles progress from "Extraction and Refinement" to "Transportation & Motor Culture" and "The End of Oil." The last image in the collection, *Recycling #10*, is that of oily footprints in the earth, taken at Chittagong, Bangladesh. The last section of the collection depicts abandoned oil wells, scrap yards with discarded jets and bombers, cars and tires, and the shipbreaking yards in Bangladesh where oil tankers go to die. By the end of the collection, readers have some idea of how oil capitalism ruination proceeds; however, the potential contamination or incorporation of these ruins beyond the scrap yards and oily footprints remains something of a mystery. Obviously, there is a conventional message here: the culture of oil leaves a footprint, and it is massive and destructive. But the image of the pipelines in the forest that opens the collection suggests we should not read the processes of petroculture as unidirectional and linear, as the obvious passage from extraction to deposit. Instead, consider the absence of human activity in the first and last images of *Oil*. Burtynsky's vision is distinctly materialist, with human activity reduced to a relatively minor presence (in the few photographs devoted to "Motor Culture" and later to "Shipbreaking" and "Recycling"). The diminution of human actors reveals at least two ways in which his photography is consonant with the "materialist turn" in cultural studies: first, his cadastral vision articulates what Patrick Joyce and Tony Bennett call the "muteness" of infrastructural power, the ways in which "infrastructure is a good location for understanding how material powers can to varying extents operate outside human consciousness and language," the durable power of "objects and processes," "this capacity to be left to operate by themselves";[86] and second, Burtynsky's relative resistance to the "close range" of smooth space suggests the primary concern of his photographs about oil is "less the ways in which objects become effective by being integrated into the subjective world of human consciousness, and more the difference they make in their own right as a consequence of their specific material properties considered relationally."[87] The story of *Oil* is the story of distributed agency within oil capitalism and the ruination of energy regime materiality, a process that

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will continue into the next dominant energy regime, or might even prevent the next energy regime from coming into being.

Mitch Epstein's *American Power*

> I wanted to photograph the relationship between American society and the American landscape, and energy was the linchpin. . . . Energy—how it was made, how it got used, and the ramifications of both—would therefore be my focus.[88]
>
> —Mitch Epstein

While Edward Burtynsky says he had his "oil epiphany" in 1997, American photographer Mitch Epstein embarked on a form of what he calls "energy tourism" in 2003 after witnessing the evacuation of an Ohio town due to environmental contamination. For five years, Epstein catalogued the various forms of American energy production and their consequences. His comments in the afterword of *American Power* reflect a realization about energy that emphasizes the current moment as one of passage:

> About a year into making this series of pictures, I realized that power was like a Russian nesting doll. Each time I opened one kind of power, I found another kind inside. . . . But now—while America teeters between collapse and transformation—I see it differently: as an artist, I sit outside, but also within, exerting my own power.[89]

Epstein's photographs share with Burtynsky's this sense of living between a dying empire and the sociality to come. Epstein and Burtynsky also share an understanding of being implicated as artists in what Imre Szeman calls "oil capitalism."[90] Many of Epstein's images, such as *Amos Coal Power Plant*, juxtapose the settings of the New Topographics, in documentary form, with the types of energy that either make habitation possible or constitute the industry for that locale. In *Amos Coal Power Plant*, a lower-middle-class habitat shares the frame with apparitional cooling towers; the connection of everyday life with what in Burtynsky's images is often a distant and secluded phenomenon—the production of energy—foregrounds the associative ethos of Epstein's photo, and the lush, saturated conceptualism of the image makes the power plant seem even more discordant by contrast, like a background created by rear projection special effects in a film. Epstein's documentary proficiency and almost surreal conceptualism

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creates an effect much like the ambiguity of Burtynsky's cadastral images: something either banal or deeply corrosive acquires an aesthetic sheen that troubles the viewer's desire to condemn in simple binarisms the social and environmental causes and effects that produced this scene. Whereas Burtynsky prefers the cadastral spatiality of the distant view and the frequently unseen materials of petroculture infrastructure, Epstein visits many of the everyday spaces and architectures of modern energy regimes. Epstein captures the associative qualities of energy production and transfer not by gesturing beyond the frame, as Burtynsky often does, but by filling the frame with uncommon objects within this transfer: the perforated American flag that adorns the refinery in *BP Carson Refinery*, or the belching stacks of the Amos coal power plant observing a high school football practice in *Poca High School and Amos Coal Power Plant*. Epstein's images of coal and oil power represent a more balanced appreciation of the energy mix in the United States and globally. As Christopher F. Jones reminds us, "coal, not oil, set the stage for American and European hegemony and the modern world order," and "globally coal consumption is on the rise, and Americans burned more coal in 1950 than they did in 1900, and more in 2000 than in 1950."[91] While coal power might represent an antiquated energy regime to the popular imagination of the overdeveloped world, its presence in Epstein's images performs the return of the repressed.

Alien Capitalism and the Dark Ecology of Burtynsky and Epstein

The content of Burtynsky's and Epstein's photographs invites an associationalist perspective on the relationships between energy and landscapes. More specifically, Burtynsky and Epstein evoke some of the implications of Timothy Morton's "dark ecology": in the way they "linger in the shadowy world of irony and difference,"[92] in the way their images are "dark but not suicidal,"[93] and in the way they foreground "hyperobjects," materials that will "far outlast current social and biological forms."[94] In *Ecology without Nature*, Morton declares that his work is "about an 'ecology to come,' not about no ecology at all."[95] The idea of "nature," so explicitly foregrounded in the photography of Ansel Adams and reconfigured in the New Topographics, "will have to wither away in an 'ecological' state of human society," says Morton.[96] "Substantialist images of a palpable, distinct 'nature' embodied in at least one actually existing phenomenon (a

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particular species, a particular figure)," he claims, "generate authoritarian forms of collective organization."[97] Morton's project is to deconstruct "nature" to the point where it no longer registers, resulting in what he calls "the ecological thought," the "thinking of interconnectedness" and a form of thinking "that is ecological."[98]

The concept of dark ecology is a "melancholy ethics"[99] that "preserves the dark, depressive quality of life in the shadow of ecological catastrophe."[100] Morton believes "we can't mourn for the environment because we are so deeply attached to it—we *are* it";[101] instead, deep ecology is "saturated with unrequited longing," "a politicized version of deconstructive hesitation or aporia."[102] In this chapter, I have suggested repeatedly that Burtynsky and Epstein represent this kind of ambivalence in their photographs, even in the face of certain catastrophe, though some might challenge this reading, perhaps not seeing the same ambivalence or irony. To this objection, I would promote dark ecology as a more ethical response to these photographs than the perspective that sees only arborescent capture; as Morton writes, "We should be finding ways to stick around with the sticky mess that we're in and that we are, making thinking dirtier, identifying with ugliness, practicing 'hauntology' (Derrida's phrase) rather than ontology."[103] Burtynsky's *SOCAR Oil Fields #4* exemplifies "the sticky mess that we're in," pausing at an abandoned oil field in Baku, Azerbaijan, to see its haunted reflection in a pool of dirt and oil. Dark ecology also promotes lines of flight that interrupt the intersection of nation and nature, cadastral map and the ecological thought. "Later in the modern period," Morton writes in *Ecology without Nature*, "the idea of the nation-state emerged as a way of going beyond the authority of the monarch. The nation all too often depends upon the very same list that evokes the idea of nature."[104] Deconstructing the synoptic view of the state conjoins with the ecological thought, when contemplating and practicing the ecology to come.

Nowhere in these collections of photographs does one find an image that intimates a possible return to some form of pristine natural world; instead, viewers must confront the toxic future of oil refineries, hundreds of thousands of kilometers of pipelines, and other hyperobjects of petromodernity. Morton compares these hyperobjects, such as the plutonium waste from nuclear reactors, to the "acidic blood of the Alien in Ridley Scott's film."[105] Indeed, in conjunction with Rob Nixon's concept of "slow

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violence,"[106] Morton's hyperobjects begin to articulate what I would call *alien capitalism*, an economic system whose materiality kills while dying, unleashes almost unimaginable toxicity even as its functionality wanes. In this sense, the sociality to come is always already toxic. Certainly, Burtynsky and Epstein do not try to avoid the toxicity to come in their haunted images.

In addition to Morton's, the work of Stephanie LeMenager speaks to the aesthetics of ecology and energy in the work of Burtynsky and Epstein. Burtynsky and Epstein provide an aesthetic experience of energy infrastructure that presents some of its associations with landscape but does not impose a solution to the problem of environmental degradation (there are no images of wind farms juxtaposed with oil refineries, for example). There are, however, several impressions of everyday life under oil capitalism: a high school football team practicing, a busy freeway, the Talladega Speedway, a McDonald's, a gas station. LeMenager rightly identifies the relationship, moving forward, between "ecological narrative"[107] and the embodied memories of life under petromodernity:

> The petroleum infrastructure has become embodied memory and habitus for modern humans, insofar as everyday events such as driving or feeling the summer heat of asphalt on the soles of one's feet are incorporating practices, in Paul Connerton's term for the repeated performances that become encoded in the body. Decoupling human corporeal memory from the infrastructures that have sustained it may be the primary challenge for ecological narrative in the service of human species survival beyond the twenty-first century.[108]

One way to decouple "human corporeal memory from the infrastructures that have sustained it" is to depict, as Epstein does, explicit conjunctions of energy production and everyday life, such as a coal-fired power plant looming over a lower-middle-class home and yard, or that same power plant spectating at a high school football practice. The juxtaposition of toxic energy production—coal power plants are the leading source in the United States of carbon dioxide and sulfur dioxide pollution, as well as significant sources of nitrogen oxides, mercury, and fly ash[109]—and everyday life performs a kind of defamiliarization that disrupts the quotidian affect associated with petromodernity. Though Burtynsky often isolates energy production from human cultures, his images of energy production, as noted above, depict the "sticky mess" we are in, what LeMenager calls the "humiliating desire and dependency of the human vis-a-vis non-human

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actors."[110] LeMenager, in a nod to Morton, calls this "feeling ecological," and it "need not be pleasant."[111]

That Ecological Feeling in Petrochemical America and True Detective

Several recent television shows situate the contamination of petromodernity as a quotidian feature of everyday life. Casey Ryan Kelly describes how shows such as *Rectify*, *True Blood*, and *The Walking Dead* portray toxicity in the American South "as a complex but discernable collective trauma that pervades everyday life in zones of human sacrifice."[112] These sacrifice zones are in fact overwhelmingly inhabited by the poor and people of color, but, tellingly, the shows mentioned above, and *True Detective* discussed below, feature casts of almost exclusively white central characters. The unpleasant reality of life at the end of petromodernity has become horrifyingly visible in popular culture, but its racist and classist quality tends to feature in these shows as background subtext. Despite this oversight, representations of *alien capitalism* and its fallout offer insight into certain forms of life in the twilight of synthetic living. For example, the opening credits for HBO's *True Detective*, season 1, feature photographs from Richard Misrach and Kate Orff's *Petrochemical America* layered into images of the central characters, symbols of sin and redemption, and more glimpses of the Louisiana coastline. One of the images in the opening montage for *True Detective* is Misrach's *Swamp and Pipeline, Geismar, Louisiana, 1998* (fig. 3.6), the haunted Other of Burtynsky's *Oil Fields #22, Cold Lake, Alberta, Canada, 2001*, discussed earlier.

Burtynsky's pipelines are shiny and new, and they curl through a pristine forest like a river; Misrach's pipeline appears to be rusted, aging, and of a smaller diameter than the pipes in Burtynsky's photo. Misrach's pipeline already belongs to the ruins of petromodernity. The forest in Misrach's photo is a leafless apparition in the retreating wetlands of Louisiana, a monument to the toxicity of the coastline and the alterations of the climate that are submerging southern Louisiana. This haunted pipeline is a premonition; it demarcates and predicts coastline erosion and toxic incursion. It bisects the bottom third of the frame as if holding back the swamp, preventing the natural from unraveling. The location is in Cancer Alley, between Baton Rouge and New Orleans, one of the most toxic stretches of industrialization in the United States.

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Fig. 3.6
Richard Misrach, *Swamp and Pipeline, Geismar, Louisiana, 1998*. © Richard Misrach, courtesy Fraenkel Gallery, San Francisco.

Kelly describes *True Detective*, season 1, as "less of a noir-themed murder investigation than a visual exploration of the degradation of the human condition in advanced industrial society."[113] In Kelly's reading of the show, "toxic exposure" is "a structural force, a constraint on human agency that noticeably inflicts pain on the bodies of vulnerable populations."[114] Kelly sees the show as an allegory for modern America, "a yellowing, or jaundiced, landscape in toxic ruin that disables its inhabitants both physically and mentally."[115] Indeed, as detectives Rust Cohle (Matthew McConaughey) and Martin Hart (Woody Harrelson) scour the Louisiana coast in search of an occult-inspired murderer, the landscape of Cancer Alley and its inhabitants visualize what Cohle describes as a "psychosphere" of "aluminum and ash," human and nonhuman industrial actants in covalent bonds of ethylene and despair. In addition to the visualization of the always already toxic spaces and populations of contemporary America, *True Detective*

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also articulates an ethic for living in this "sticky mess," this sickly body politic.

As a piece of genre television, *True Detective* trades in several familiar conventions: everything from the mismatched detective partners to the final showdown with the villain in a space of ruins. In this context, one could argue that the suicidal trajectory of Detective Cohle, who lost his young daughter in a car accident, also replicates the convention of the self-destructive cop, a convention usually paired with some kind of substance abuse. However, *True Detective* undermines its collection of clichés by the way in which it situates suicide, transforming suicide from a character arc into an ontological problematic, and as a result the show performs more than just a visual representation of environmental contamination: this is a show about living with ontological toxicity. In conversation with his partner Martin Hart, Rust describes his antinatalist philosophy, his belief that "the honorable thing" for human beings to do "is to deny (our) programming. Stop reproducing, walk hand-in-hand into extinction." When Marty asks why Rust bothers living, Rust replies that he lacks "the constitution for suicide." It is the first mention of suicide in the show, and it is articulated both in terms of the belief that humanity would be better off never having been born, and in terms of the individual choice of Rust to continue living after the death of his daughter. Clearly, Rust's antinatalism emerges from the tragedy of his daughter's death. The two subjects, suicide and dead children, become inextricably bound in the show's narrative: the death or murder of young children defines the horrific crimes Marty and Rust are trying to solve; the death of Rust's daughter provokes his suicidal thoughts; during the investigation of the Dora Lange murder, an informant commits suicide (or is "suicided") in a jail cell; Rust encourages a child-murdering mother to kill herself before going to jail; and children and suicide coalesce in the ambiguities of the show's conclusion, which enacts a form of what Lee Edelman calls "reproductive futurism."

Edelman describes reproductive futurism as "terms that impose an ideological limit on political discourse as such, preserving in the process the absolute privilege of heteronormativity by rendering unthinkable, by casting outside the political domain, the possibility of a queer resistance to this organizing principle of communal relations."[116] Reproductive futurism circumscribes ideological possibilities by privileging the survival of the body politic, often articulated in the "coercive universalization" of what

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Edelman calls "the image of the Child."[117] In *True Detective*, the image of the horizon of horror is identified with a videotape of a ritual murder of a young girl; the tape is analogous to the play in Robert Chambers's *The King in Yellow* that inflicts madness on readers who read beyond the first act. The greatest threat to the social order, in terms of the show, runs parallel with Rust's battle with suicidal ideation: the death of a child, the death of the "insistence of hope."[118] The nihilistic horizon of the in-show universe and the character of Rust ask a similar question: If we can't protect the (image of the) children (the future social order), do we deserve to live? Rust could not protect his daughter from dying accidentally. Marty and Rust together pursue a secret society of child-molesting, occult-inspired murderers. The question that looms over the conclusion of season 1 is whether the show will reify the cult of the child, or whether Rust will continue to efface the "insistence of hope." For most of the show, Rust seems to embody what Edelman calls queer resistance, an "oppositional status" against reproductive futurism, one that does not "intend a new politics, a better society or a brighter tomorrow, since all of these fantasies reproduce the past, through displacement, in the form of the future."[119] Rust's self-imposed exile and antinatalist philosophy appear to be forms of queer resistance, until he reunites with Marty and reopens the investigation of the unsolved murders they had disbanded years earlier. The narrative trajectory and thematic appeal of the show pivots on the "act of resisting enslavement to the future in the name of having a life,"[120] what Edelman also describes as "this willingness to insist intransitively—to insist that the future stop here."[121] The show's ambiguous ending, when Rust declares "once there was only dark" but now "the light's winning," suggests a restoration of the social order, a refutation of the antinatalist philosophy he espoused throughout season 1. A diplomatic reading of this conclusion might decide that Rust remains pessimistic but no longer in the grip of suicide. Rust's suicidal trajectory parallels the "sticky mess" of living with the aftermath of petrochemical catastrophes: If the future is already a toxic mess conjoined with catastrophic global climate change and a host of other calamities—what Jean-Luc Nancy calls "a civilizational catastrophe that expands every time [a so-called natural catastrophe occurs]"[122]—and many of these calamities can be diminished but not eliminated, then living with the effects of ubiquitous toxic contamination means we must refuse to reproduce the social order that created this condition (capitalism, petrochemical industries, the technoscientific

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order), and imagine contemporary ethics as a hopeless enterprise. Rather than see hopeless politics as nihilistic, hopelessness is radically self-effacing and profoundly antihumanist.

Season 2 of *True Detective* (2015) implicates infrastructure construction in the actual plot. The much-maligned second season involves a convoluted story about dirty politicians, cops, gangsters, and the construction of a high-speed rail line in central California, a plan that resembles the actual high-speed rail line approved in 2008 and for which construction began in 2015. The first phase of the real-life line, which will connect San Francisco with Los Angeles and Anaheim, is estimated to cost $64.2 billion. In *True Detective*, season 2, the central storyline involves politicians and gangsters competing to profit from the land and government contracts dedicated to the rail line construction. In the show, the fictional city of Vinci is played by the city of Vernon, California, famous for its corruption, and Vernon landmarks such as the Vernon Light and Power Facility, an art deco building constructed in 1929, provide architectural touchstones of hyperindustrial noir.[123] In the first episode of season 2, an aerial shot of the BP refinery in Carson, California—the same refinery photographed by Mitch Epstein in *BP Carson Refinery, California 2007*—is supposed to represent industry in the fictional city of Vinci. By channeling a real infrastructure megaproject as the premise for a neo-noir serial, Nic Pizzolatto, the series creator, combines the genre's penchant for cynicism and despair with the modernist myth of the progressive trajectory of industrial infrastructure; the most famous antecedent of this story is, of course, Polanski's *Chinatown* (1974), which was very loosely based on William Mulholland and the Los Angeles Department of Water and Power. *True Detective* and *Chinatown*, like the many films, television shows, and novels discussed in this book, remind viewers of the ideological composition of infrastructure, but, in the case of these "infrastructure noir"[124] narratives, the story of modernity dovetails with noir misanthropy in a paradoxical collision of cultural myths about human agency. The corruption that surrounds the high-speed rail project in *True Detective* smothers technophilic optimism, and the crushing existential presence of infrastructure megaprojects, once constructed, achieves a sense of fatalism that is concrete, immediate, and of a scale that moody, darkened, rain-swept streets, with their menacing portent, cannot match. That is, film noir coincided historically and ideologically with a postwar, post-bomb, post-Holocaust reality, and birthed an important component

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of the aesthetic of infrastructural brutalism: the urban condition in which nothing, not even paved roads and an increasingly international mobility, could alleviate the feeling that industrial civilization is doomed. Industrial infrastructure, in the large dams that powered the development of nuclear weapons and the railways that facilitated the Holocaust, was essential to the disillusionment registered by film noir.

Deleuzoguattarian Ecology and the Synoptic View

The media examined above provide a series of cultural objects with which to consider relationships between agency and energy in oil capitalism. As demonstrated by reference to the "material turn" in cultural studies and the poststructuralist associationalism of Deleuze and Guattari, the foregrounding of infrastructure in the context of oil capitalism in these photographs offers an occasion and a visual lexicon for interrogating the "cascade of intentionalities" sometimes unseen in everyday life. Agency, once explored through a materialist and associationalist lens, appears distributed among human and nonhuman actors, as scholars in science and technology studies have argued for some time, and the images of oil wells, pipelines, and power plants represent temporary stabilizations of agency observable from the cadastral perspective of the state. What are some of the consequences of this theory of agency? In particular, what Deleuze and Guattari call "geophilosophy"—described by Patrick Hayden as an "attempt to formulate a mode of thinking in association with, and as the affirmation of, the diversity and multiplicity of the continuous becomings of a fluctuating natural reality"[125]—represents a form of ecology that is antiessentialist, antihumanist, and decentralist. The basic question of geophilosophy, for the current moment of ecological crises brought on primarily by oil capitalism, is the following: "How do Deleuze and Guattari help us rethink our ecological crises beyond the impasses of State-sanctioned resource exploitation and reactive environmentalism?"[126] This impasse is a source of ambivalence commonly found in critiques of Burtynsky's work. As Bernd Herzogenrath explains,

> As a conceptualizing machine, [Deleuzian philosophy] can provide ecology with concepts that complement its scientific prospects or "reprocess" its inherited philosophical notions. Deleuzian concepts are "ecological" in the sense that they do not address the essences of things, but the dynamics of events and the becomings that go through them.[127]

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The philosophy of becoming advocated by Deleuze (and Guattari) allows for the "active, unfinalized flux of constantly circulating relations, interactive encounters, and shared transformations" among the Earth's "natural-social habitats,"[128] while simultaneously it offers political ecology a consideration of "which concepts, practices, and values best promote the collective life and interests of the diverse modes of existence inhabiting the planet."[129] In this sense, Deleuzoguattarian ecology works against the systematizing and categorizing of conventional imperialist science. Deleuze and Guattari are unique in poststructuralist circles in their promotion of a form of naturalism that is antiessentialist and avoids reactionary nostalgia for some kind of pristine past.[130] Instead, Deleuze promotes "a type of naturalism that highlights the diverse interconnections between human and nonhuman modes of life, in such a way as to provide some overlooked philosophical resources for integrating ethical and political considerations with ecological concerns, while resisting the reductive temptation to turn nature into a static metaphysical foundation."[131] This form of naturalism stands in contrast to some prominent thinkers in the anarchist tradition because it rejects both "a static metaphysical foundation" (including an essentialist understanding of human nature) and forms of speciesism that have contaminated Left thinking, as Steven Best writes, "from Kropotkin and Marx to Bookchin and beyond."[132]

A Deleuzoguattarian ecology emphasizes the micropolitical over the macropolitical, but not to the exclusion of the macropolitical. Hayden argues, "for ecopolitical activism to engage itself effectively, it must steer clear of universalized abstractions and carefully study the specific needs and alternative possibilities within localized situations."[133] The global scale of the ecological crisis has led some to demand a global solution; however, "a micropolitical focus on the particular needs and interests of diverse local habitats and inhabitants in light of the available knowledge of ecological conditions will perhaps better contribute to the creation of effective ecopolitical interventions than will a focus solely from a unitary, large-scale framework."[134] This mode of thought is also consistent with the anarchist preference for direct action and aversion to bureaucratic and institutional structures. Any global response to environmental crises is more likely to produce arborescent power structures than it is to produce open multiplicities. Deleuzean micropolitics "is about critical emancipation, not necessarily *from* systems, but *towards* other types of open systems."[135] For centuries,

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state capitalism has killed Indigenous ways of existing and nonhuman animal species. The prolonged emancipation from this rule of arborescent thought will require an unprecedented proliferation of "open systems" attuned to "diverse local habitats and inhabitants," not a one-world order of resistance. That will include avoiding forms of ideological purity, at times, something many revolutionaries find challenging.

Finally, a Deleuzoguattarian ecology could embrace their concept of machinic assemblages, not only for the epistemological and ontological advantages of a process philosophy that emphasizes relations over essences, but also to avoid the limitations of debates over what kinds of technology—self-contained types—are appropriate for an anarchist politics. Herzogenrath summarizes the advantage of the concept of the "machine" in Deleuze and Guattari, which concerns connections rather than essences: "Their model [of machines] also affords a single mode of articulating developmental, environmental, and evolutionary relations within ecological systems, and makes room for a conceptualization of a general, nonanthropomorphic affectivity within dynamic systems."[136] From this perspective, a Deleuzoguattarian ecology concerns itself with "resonances, alliances and feedback loops between various regimes, signifying and non-signifying, human and non-human, natural and cultural, material and representational."[137] The resulting philosophy avoids outmoded invocations of the technology neutrality thesis and Manichean compartmentalizations of "good" and "bad" technology: "[Deleuze and Guattari's] 'machinism' avoids both technophilia and technophobia, its guiding principle being that of the invention of possibilities of life."[138] Instead, as Mark Halsey notes, the "function of machines" in Deleuze and Guattari "is to break and redirect flows—flows of capital, wood, metal, genes, friendship, knowledge, work and so forth."[139] How machines connect flows of desire and produce habit-forming potentials is never simply a question of *doing the right thing* for the environment, obviously, and something always escapes machinic encoding. But at least Deleuze and Guattari offer a perspective that always seeks to proliferate the "invention of possibilities of life."

Halsey argues that this perspective forces the question, "What would it mean to cease mapping the earth? Alternatively, what might it mean to map earth according to, for instance, a becoming-eagle, a becoming-fish, a becoming-redwood, a becoming-worm, or a becoming-river? This is what Deleuze and Guattari demand of us—that we move beyond the bodies,

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lexicons and modes of envisioning traditionally associated with late capitalist subjectivities in order to develop and inhabit the worlds of others."[140] Burtynsky reminds us of the cadastral legacy of the synoptic state, but as a place of passage. He does not offer the perspectives of nonhuman animal subjectivities. In that regard, his photos are generative but not radical or transformative. As Halsey concludes, "What else are environmental problems other than the visible and audible result of attempts to constitute various portions of earth as a unity in spite of its being a multiplicity? The challenge, it would seem, is to develop a lexicon which does the least violence to the nuances of each (socio-ecological) event."[141] In this context, the photographs of Burtynsky, Epstein, and Misrach effectively invite viewers to see oil infrastructure and human interaction with it as a multiplicity with distributed agency. Rather than depict alternatives to oil capitalism, these photographers show us places of passage in the infrastructural web of human and nonhuman actors; they foreground the transitional, associative, and conjunctive debris of petroculture. They show us that we are becoming something other, but do not dictate the terms on which this passage shall be accomplished or its destination.

The transition from postempire to the sociality to come has, because of the material infrastructure of the petromodern state form, more than simply ideological possibilities: the gathering storms of climate crises, toxic hyperobjects, and rapid resource depletion, all intimately connected to the infrastructure of petrodmodernity, represent an assemblage of material conditions that threaten the survival of the human species. Unlike liberal and progressive responses to oil capitalism, which often propose technological fixes or global institutional arrangements, a Deleuzoguattarian ecology is better equipped to describe and respond to the *longue durée* of petromodern infrastructure, the "slow violence" of its principal assemblages, and the suicidal state form of hydraulic sciences that are slowly but surely striating the escape routes.

Will the Ruins of the State Form Wither Away?

To conclude this chapter, I offer a provocation concerning ruins, the state form, and revolution. If the passage from the global order of oil capitalism to *the sociality to come* must pass through the hyperobjects of oil capitalism—the durable ruins of this ecocidal order—then what

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consequences might this have for the very concept of revolution? Specifically, most of the anarchist and Marxist left believes in a revolution that abolishes the state form; indeed, given the material constitution of the petromodern state, perpetuation of the state form effectively concedes near-term human extinction as inevitable. However, if we consider the durable effects of the petrostate—global warming, plastics, etc.—as part of the state form, a state form as hyperobject, then how does this material afterlife for the petrostate impact the politics of state abolition? To contemplate this question, consider the photography of Ernst Logar in *Invisible Oil*, especially the image *Tillydrone*.

Logar's *Invisible Oil* project examines North Sea oil and its impact on Aberdeen, foregrounding the otherwise obscured spaces of the oil industry. While *Invisible Oil* includes sculpture and photography, here I will focus on one photograph as a kind of visualization of the question that motivates this conclusion. Tillydrone is in the northern part of Aberdeen, and Logar's photograph is one of several based on recovering oil-based refuse from the beaches of Aberdeen and constructing sculptures of offshore oil rigs with the garbage. This offshore rig wrapped in plastic, sitting on the shore of Aberdeen, disrupts an idyllic view of the North Sea and brings into view the durable synthetic waste of petroleum: the one million plastic bottles purchased every minute worldwide, of which not even half are recycled;[142] the 8 million tons of plastic that end up in the ocean every year, including trillions of microplastics that are carried by currents into the Arctic;[143] the fact that there will be more plastic waste than fish in the sea by 2050, if current practices do not change[144] (and some scientists believe it is already too late to remove the plastic from the oceans).[145] This synthetic product of petromodernity now approaches climate change in terms of its potential devastation to ecosystems. *Tillydrone* shows viewers the shape of the global oil industry under capitalism, what the industry overwhelmingly produces; whereas Warren Cariou's petrography, which opened this chapter, reflected and therefore implicated the viewer in the technosocial assemblage that created the art made from a naturally occurring substance, *Tillydrone* confronts viewers with a synthetic creation of an economic system that is inherently ecocidal. The social organization that has extracted and consumed oil on a global scale now leaves a wake of plastic debris whose turbulence will reverberate for centuries. It will require an estimated $68 billion, much of which will be covered by British taxpayers, to decommission the UK oil and

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Fig. 3.7
Ernst Logar, *Tillydrone*, 2008. © Ernst Logar, 2008.

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gas fields of the North Sea, a project that will take at least 40 years; the Norwegian Petroleum Directorate estimates its own decommissioning efforts at $19 billion, and Denmark will have to spend at least $4 billion; and these estimates could double or triple over time.[146] What does revolution look like in this context?

One of the many compelling insights in Allan Stoekl's book *Bataille's Peak* is the recognition that the other side of peak oil will not be a simple reflection of petromodernity's ascent. "It is tempting to assume a simple reverse dialectic: the return of the feudal," writes Stoekl, "but there is more than an energy blip that separates us from the Middle Ages."[147] He continues:

> We cannot simply flip over the dialectic and predict a decline where previously there had been an advance. . . . The unknowable future will not be conceivable as the simple downside of a bell curve. . . . We cannot assume that we will be forced into any given social regime by any given energy regime.[148]

Stoekl argues that one thing that separates the "downside" of the peak oil bell curve from the "upside" is what he calls "the fact of knowledge": "Non-knowledge is not simple ignorance, but the follow-through of the consequences of attained knowledge; in our case, this implies a full understanding of the energy regime of modernity, the benefits and pitfalls of rationalism and humanism."[149] A significant set of material consequences issue from the petromodern state form, an energy regime that prizes fossil fuel consumption, and the hydraulic apparatus necessary to territorialize space. While some peak oil observers may envision the post-oil era as a return to technosocial assemblages of earlier stages of capitalism, perhaps even to a neofeudal order defined as much by its technologies as by its wealth disparity, the hyperobjects of the petromodern state form—such as global climate change, landscapes erased and refashioned by infrastructure, and durable forms of industrial toxicity—must be factored into any consideration of the coming assemblages. The petromodern state form has created objects of almost unimaginable size and persistence, akin to what Timothy Morton calls "hyperobjects," because they are "massively distributed in time and space relative to humans."[150] Anthropogenic global climate change, a by-product primarily of industrial capitalism, will continue to reverberate with distributive agencies for hundreds, thousands, or even millions of years. This particular hyperobject emerged from an assemblage that includes hundreds of thousands of miles of oil pipelines, railroad tracks,

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and paved roads, as well as consumers, zooplankton, algae, and automobiles. If anthropogenic global climate change, abandoned shopping malls, and parasitic tendrils of pipelines that ensnare host organisms are hyperobjects with a prolonged material existence courtesy of the petromodern state form, then what are the implications for antistatist politics? What does it mean to "abolish" the state, if the state form includes durable, massively distributed objects? Can the state "wither away," as in Marxist-Leninist theory, if its material form includes such persistent objects? Similarly, how will revolutionary projects address engineering megaprojects that could require decades to decommission, or inherently unstable and potentially omnicidal infrastructure such as nuclear reactors and their waste, which, once constructed, require particular kinds of persistent and expert attention in the process of decommissioning or maintaining?[151] The petromodern state form is also not a material tendency that will be abandoned anytime soon, barring a significant energy crisis; China, for example, has spent the last 30 years engaged in the most rapid and widespread urbanization project in human history; according to BP, global petroleum consumption and carbon dioxide emissions achieved record highs in 2015;[152] and there are approximately 435 nuclear reactors worldwide, with 71 more under construction.[153] In other words, opposition to the petromodern state form is not simply a matter of confronting the ruins of modernity; it is also a matter of finding ways to halt, sabotage, and destroy the expansion of the petromodern state form.[154] It is also, unfortunately, about learning to live with irreversible material tendencies, such as the collapse of the West Antarctic ice sheet or the mass extinction event currently in process, while adapting to emergent structures and agencies.

Some hyperobjects are categorized under the term infrastructure, and this is the category most explicitly identified with state formation. While state formation obviously includes symbolic indoctrination and violent domination, this brief provocation emphasizes only the infrastructure of state capitalism. The "hydraulic science" of the state form[155] is often implicated in discourses of nationalism to signify modernity and notions of progress; in some instances, material instantiations of infrastructure have "accompanied and transcended 'official' processes of political and economic integration" of nation-states.[156] Patrick Joyce and Chandra Mukerji recommend the state form be defined as "an assemblage that is distinguished as a whole by its ability and tendency to use logistical power," a processual,

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associationist definition of statism that also emphasizes state "territorial, legal, and bureaucratic infrastructures [that are] unlike other institutions" that "exercise logistical and impersonal power," such as corporations.[157] As I suggested in the introduction to this book, state logistical power, to the extent that it dispossesses people for extractive industries and fossil fuel infrastructure, is now suicidal. Who governs these industrial assemblages is relatively insignificant, given the material and ideological pressure they exert on governance. While the state form also includes institutions, symbols, practices, and ideological propensities, here the focus is on the material legacies of infrastructure to emphasize the durability of the state form and the challenge this poses to its abolition.

If petromodern infrastructure represents a kind of hyperobject that is massively distributed in time and space, then what does it mean to "abolish the state"? In the nineteenth century, of course, Marxists ridiculed anarchists for their desire to abolish the state "immediately"; instead, Marxists typically advocated some kind of intermediate period following the revolution, in which a proletarian state would govern and then dissipate. The Marxist philosopher Henri Lefebvre describes the Marxist-Leninist notion of the "withering away of the state" in the following manner:

> The proletariat must have a State. This State is not that of the bourgeoisie, it is that of the proletariat organized as the ruling class. But this state is such that it begins immediately to wither away and cannot but wither. The passage is categorical.[158]

Most theories of the state admit some combination of material and semiotic components, the state form as institutions, practices, and iconography. Recently, however, some historians of the modern state have emphasized its material legacies. In particular, scholars such as Tony Bennett, Patrick Carroll, Patrick Joyce, Chandra Mukerji, Jo Guldi, and Germà Bel have explored the material properties of state formation, especially the construction of infrastructure. The enduring material legacies of state formation are not deterministic, but they definitely articulate specific affordances and constraints. As Joyce and Bennett note, "if certain capacities or affordances are 'built-in' to the material world this is very far from dictating outcomes, for these affordances are continually disrupted and transformed through the action of the innumerable other agencies of things and people." The power of infrastructures might lie in their "very muteness, this capacity to be left to operate by themselves,"[159] but such an observation should never

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be confused with the idea that infrastructure does not require human participants, or with the incorrect belief that infrastructure is invisible.

Infrastructure thus typically escapes theories of the "withering away" of the state form, and this omission produces significant forms of myopia in certain revolutionary politics. Would oil and gas pipelines wither away "categorically" following a proletarian seizure of the petromodern state? No, they obviously would not. How problematic is such a material legacy, in the context of anthropogenic climate change? The anarchists of the nineteenth century were right—the state should have been abolished immediately. In hindsight, the success of Marxist revolutions around the world in the twentieth century—revolutions in which the state not only remained but expanded the reach of industrial infrastructure—produced conditions in which communist countries, such as China and Russia, could easily transition from state communism to state capitalism. The result is that the urbanization of China has all but guaranteed that global climate change, largely a consequence of Western industrial capitalism, will lead to the extinction of the human species, or at the very least will produce global ecological conditions that ensure a mass die-off of humans in the coming century. In other words, the anarchists were right, but now it is too late for even an anarchist revolution of breathtaking scope and success to reverse the effects of industrialization; the best we can hope for is a revolution that slows the pace of destruction and perhaps avoids human extinction. The question does remain, however: How will the hyperobjects of petromodernity shape radical politics in the context of attenuated catastrophe?

Attention in social theory to the materiality of infrastructure is not by itself new: "Since the eighteenth century, experts have seen 'the government of things' as one of the central tasks of state rationality."[160] The materiality and legacy of particular state infrastructures may offer lessons in how to resist particular political assemblages, how to adapt to conditions of collapse, or how to build revolutionary infrastructures. Understanding the history of infrastructure may assist with adapting to its collapse. In some cases, infrastructure has significantly shaped politics for centuries. For example, Germà Bel describes the impact of infrastructure policy in Spain over hundreds of years. Bel connects eighteenth-century infrastructure planning to the centralization of Spanish governance, a model that was supposed to imitate how Paris was situated within France.[161] In recent years Spain made connecting all of the provincial capitals with Madrid by high-speed rail

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"a national objective," thus becoming "an extreme example of the use of infrastructure policy in the service of territorial hierarchical structuring and the organization of power in Spain."[162] Likewise, the design of postal routes in the nineteenth century in service of the monarchy, for example, "established a radial network whose characteristics have remained unchanged up to the present."[163] These forms of transportation infrastructure "left a permanent imprint on Spanish politics."[164]

Jo Guldi would describe Bel's depiction of Spain as an example of the "infrastructure state." Guldi describes the history of Britain's roads in the nineteenth century, the origins of which date back to 1726 and the military survey of Scotland: "Rich and poor regions were pitted against one another as new political fault lines opened over issues of access to infrastructure."[165] The conflict over the design of roads, of course, was a conflict over "the flow of bodies, information, and goods."[166] The standardization of toll booths and sidewalks oriented "labor and capital to a new centralized management."[167] Guldi argues that the separation of trade and the state on "ancient" highways was erased by the advent of the infrastructure state.[168] The infrastructure state was built "around the logic of conquest,"[169] and ensured that the paving and management of roads included the application of "manuals, forms, and bureaucratic hierarchy" in the scrutiny of every component of construction.[170] Despite the expectation that infrastructure such as paved roads would bring an egalitarian peace to the land, such infrastructure instead pitted "region against region, experts against the people, and class against class."[171]

To the examples of Spain and England, Patrick Carroll adds Ireland as another case study that proves, he says, the modern state is "by definition" an "engineering state."[172] Carroll argues that "modern statecraft is science-based as well as coercion-based":[173] "It is through the state-system that governing *practices materially incorporate* land, bodies, and built environment into the state-country."[174] This coalition of statecraft and engineering, especially given the ubiquitous toxicity of modern industrial capitalism, articulates the material pervasiveness of the state form, something Carroll describes as a "plexus" or "dense and minutely interwoven structure of intercommunicating fibers or tissues."[175] The shift in analytical model for Carroll, and similarly for Patrick Joyce, involves an emphasis on practices of government instead of the rationalities of government, the latter of which are the emphasis in governmentality studies.[176] Carroll sees his

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methodology as a "single triangulated distinction among state discourses, state practices, and state materialities"[177] that transforms land, people, and the built environment into "a socio-technical network of techno-territory, bio-population, and infrastructural jurisdiction."[178]

Finally, Chandra Mukerji has written about the emergence of the "territorial state" in seventeenth-century France. This "transformation of the French landscape—with the construction of fortresses, factories, garrisons, canals, roads, and port cities—imprinted the political order onto the earth, making it seem almost an extension of the natural order."[179] Massive infrastructures enabled power to be exercised according to bounded territories instead of through centers of power such as towns or cities.[180] As Carroll argues, this new state form was an engineering achievement as much as it was anything else, and Mukerji similarly emphasizes material practices and not simply rationalities. Under Louis XIV, "territorial politics entered the French court, not as a threat to the king, but as a way to associate his legitimacy with the management of the state."[181] In her book *Impossible Engineering*, Mukerji examines how the construction of a canal "pointed obliquely toward techniques of governance that lay beyond the visible and familiar practices of domination—war, taxation, and court life."[182] The building of the Canal du Midi, however, was not simply a triumph of isolated expertise: it "was a product of a collective intelligence—the work of groups with both formal and vernacular expertise in land measurement, construction, and hydraulics."[183]

Today, the industrial capitalist state claims a similar kind of territorial legitimacy by defining infrastructure in terms of the state's projection of force: "critical infrastructure protection" aligns state legitimacy and violence with the necessities of life to such an extent that to oppose the state is to oppose one's own right to clean water, electricity, telecommunications, heat, and so on. As commitment to the state form collapses, the state escalates its regulatory and coercive apparatuses designed to necessitate dependence on the state form. For example, dozens of American cities, including Los Angeles, have passed laws making it illegal for homeless people to sleep in their cars.[184] A woman in Cape Coral, Florida was taken to court by the city because she refused to use city water and electricity—in essence, she was living off the grid.[185] In the Canadian province of Alberta, a special detachment of the RCMP protects oil and gas pipelines from sabotage. Eminent domain and other forms of state expropriation, often in order to build

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industrial infrastructure, also continue to ensure the encroachment of the state form. The gradual accumulation on the frayed perimeter of the state form challenges the private property regime through massification: over 1 billion humans currently live in slums, a number estimated to grow to 2 billion by 2020. And these intensifications of collapse and state encroachment assemble on the corpses of Indigenous people, the original victims of the petromodern state.

These historical examples must be matched with contemporary engineering megaprojects such as large dams, industrial mining, and even the Internet, which, in their scale, capacities, and endurance, ensure the concomitant flow of resources into industrial capitalism and the incremental elimination of escape routes from it. The suicidal trajectory of the state form, which begins with genocidal campaigns to erase Indigenous populations and ends in the long shadow of species extinction, has produced hyperobjects such as global climate change, plastic oceans, and nuclear contamination which will outlast even the most successful seizure of state power or transformation of statist relations. The petromodern state form cannot "wither away" for decades, centuries, or perhaps thousands of years. The implications for antistatist revolutionary theories are profound. Lefebvre believed Marxism itself could not survive such a reality:

> I think that if the theory of the withering away of the State is false, it must be abandoned, thrown overboard. If ever it were proven that the State could not be made to wither away, that the State is destined to prosper and flourish until the end of time, then Marxism as a whole would have to jump ship.[186]

The hyperobjects of petromodernity may continue to haunt life on earth long after humans disappear, a prospect that nineteenth-century socialists probably could not imagine. While nineteenth-century socialisms were primarily interested in communizing industrial civilization, contemporary radical politics must grapple with the material legacy of petromodernity while trying to imagine a better world in the context of one whose ecological systems are in dramatic and attenuated decline.

Radical antistatists should continue to work toward the abolition of the state form; however, antistatists must also theorize practices that incorporate the hyperobjects of petromodernity, search for ways to minimize their damage to life on earth, and recognize that the "rationalism" and "humanism" that produced the current crisis cannot be the solution to that crisis. To understand the ethical implications of distributed agencies and the

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functioning of radical contingencies is to understand that antihumanist thought and behavior have the potential to benefit humanity, and that an openness to emergent agencies may be a more effective response to technoscientific catastrophe than an escalation of technoscientific engineering of solutions. Above all, radical antistatist politics must envision self-interest in a radically diffuse way. Jane Bennett offers a view of a world of distributed agency and radical contingency:

> And in a knotted world of vibrant matter, to harm one section of the web may very well be to harm oneself. Such an enlightened or expanded notion of self-interest *is good for humans*. A vital materialism does not reject self-interest as a motivation for ethical behavior, though it does seek to cultivate a broader definition of self and of interest.[187]

In terms of state infrastructure, this "expanded notion of self-interest" may help humans cope with the collapse of a massively distributed technosocial assemblage by helping us understand the dangers and potentials of material structures at a distance. Awareness of engineering megaprojects, for example, encourages humans to imagine their own effacement, their own slide into agential irrelevance. Perhaps the humility gained by such an experience of massive objects will contribute to a retreat from modernist self-aggrandizement. Similarly, the degree to which we are locked into centuries of global climate breakdown provides humans with another recognition of the transient nature of multicellular organisms in the deep time of life on Earth. Perhaps such spatial and temporal humbling will compel humans to adopt antihumanist orientations, the politics of modesty, material retrenchment, triage, and hospice in the age of collapse. If the self becomes as massively distributed in time and space as our infrastructural assemblages, we might see self-interest as slow, materially interconnected, and capable of agency at a distance, a transition from the dromological, aggressive, speciesist orientation of petromodernity.

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4 Death Train Narratives

> Revolutions are the locomotives of history.
> —Karl Marx

> Marx says that revolutions are the locomotive of world history. But perhaps it is quite otherwise. Perhaps revolutions are an attempt by the passengers on this train—namely, the human race—to activate the emergency brake.
> —Walter Benjamin

> All past revolutions have failed because they couldn't take the engine.
> —Curtis, protagonist in *Snowpiercer* (2013)

The "death train" narrative—with its historical roots in the colonialist projects of the nineteenth century (such as the Ugandan "Lunatic Express") and the war crimes of the mid-twentieth century such as the Burma Railway ("the Death Railway") and the Nazi Holocaust—foregrounds the necropolitical valences of state and capitalist logistics and the industrialized expansion of capitalist accumulation. In addition to the actual death trains—historical events in which either the construction of a railway or the operation of one resulted in mass casualties—the death train is also a potent metaphor for the structural violence of industrial capitalism: in 2003, Subcomandante Marcos of the Zapatista National Liberation Army referred to the World Trade Organization as a "death train" that must be "derailed."[1] The death train of logistical and infrastructural violence in the era of late capitalism threatens to expand its access and velocity within an already suicidal global system. The railways may have had multiple and varied social, psychological, and ecological impacts on the colonial period,

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but they were absolutely essential to the creation and expansion of empire and in the formation of the postcolonial states that succeeded empire.[2] "Railway imperialism" transformed societies and imposed imperial interests on domestic politics: "The locomotive clearly had a unique propensity for integrating and annexing territory, for monopolizing its resources, and for preempting the future of great stretches of country."[3] Rail lines such as the Uganda Railway, which linked interior Uganda and Kenya with the port of Mombasa, followed a pattern common to imperial railways: these railways embedded imperialist interests by connecting "promising pastoral and agricultural areas to ports," which captured the economic activities of colonies within the export-import dynamics of the empire and thereby ensured an economic form of subordination to the colonies' "chief imperial financier and trading partner."[4] The 30,000 miles of rail constructed in India, for example, made the Indian supply of "raw cotton, wheat, jute, and tea in return for British cotton textiles and manufacturers" a more valuable colonial exploit to Britain than was Canada or Australia; while not improving the lives of Indian peasants, the railway "affiliated Indian landlords and bankers politically as well as economically with the Raj."[5] While colonial apologists often frame the railroad in places such as India as some kind of gift from the British, the history of rail construction in India was comprehensively dictated by colonial interests:

> The railways were first conceived of by the East India Company, like everything else in that firm's calculations, for its own benefit. Governor General Lord Hardinge argued in 1843 that the railways would be beneficial "to the commerce, government and military control of the country." In their very conception and construction, the Indian railways were a colonial scam. British shareholders made absurd amounts of money by investing in the railways, where the government guaranteed returns double those of government stocks, paid entirely from Indian, and not British, taxes. It was a splendid racket for Britons, at the expense of the Indian taxpayer.
>
> The railways were intended principally to transport extracted resources—coal, iron ore, cotton and so on—to ports for the British to ship home to use in their factories. The movement of people was incidental, except when it served colonial interests; and the third-class compartments, with their wooden benches and total absence of amenities, into which Indians were herded, attracted horrified comment even at the time.
>
> And, of course, racism reigned; though whites-only compartments were soon done away with on grounds of economic viability, Indians found the available affordable space grossly inadequate for their numbers. . . .

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> Nor were Indians employed in the railways. The prevailing view was that the railways would have to be staffed almost exclusively by Europeans to "protect investments." This was especially true of signalmen, and those who operated and repaired the steam trains, but the policy was extended to the absurd level that even in the early 20th century all the key employees, from directors of the Railway Board to ticket-collectors, were white men—whose salaries and benefits were also paid at European, not Indian, levels and largely repatriated back to England.[6]

The necropolitical features of the colonial railroad in India became most visible during the Great Drought of the 1870s, one of the late Victorian holocausts discussed by Mike Davis. Instead of providing a technosocial bulwark against the Indian famine from 1876 to 1878, the new railroads were "instead used by merchants to ship grain inventories from outlying drought-stricken districts to central depots for hoarding (as well as protection from rioters)."[7] Over a century later, in 2017, in the US state of Florida, as Hurricane Irma approached and residents were told to evacuate, the significantly diminished and privatized passenger trains in the state were not used to assist with the evacuation, arguably another example of railroads and necropolitics intersecting during a natural catastrophe. The railway was also an integral infrastructure in the spread of white settler colonialism and the brutal subjugation of Indigenous people in the Americas and Africa.[8] As Manu Karuka astutely notes, what he calls "railroad colonialism" sought to restrict forms of resistance to "the death threat of imperialism," and the capitalists and politicians who invested in colonial railroads "invested in the futures of colonialism."[9] Not only the rail lines but also the bureaucracies and logistical tendencies embedded in railroad colonialism expanded and sometimes anticipated the necropolitical governance structures, mobilities, and extractive flows of colonialism. "Railroad promoters anticipated the exchange value of Indigenous lands," writes Karuka, "even before the onset of colonial jurisdiction."[10]

The structural violence of railroad colonialism also extended to working people in Britain, by the ways in which the railways paralleled the class system in their provision of mobility and comfort to the bourgeoisie.[11] The necropolitical features of the railway included its role in expanding the working class and establishing an exploitative financial regime:

> The railways not only helped continue the class system by defining new types of discrimination but also led to massive expansion of the working class. They enabled the migration of huge swathes of the population from land-based

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> employment or subsidence farming to paid work for capitalist businesses, not only for the railway companies themselves but for the huge supply chain that grew up to service them as well as a wide range of other industries needing large amounts of labor. The railways not only allowed people to live further away from work, but also stimulated the development of the financing system on which capitalism's growth depended. Indeed, the expansion and spread of capitalism paralleled that of the railway. The construction of the railways was the biggest enterprise ever undertaken—certainly since the Egyptian pyramids and the Roman roads and aqueducts, and arguably far greater than any of those—and to support this huge construction program, a banking and finance system had to be created.[12]

In addition to enabling colonial infrastructures and expanding the materialities of capitalism, the railways also provided economic efficiencies for the slave trade system that allowed for its continuation.[13] Construction of the railway systems in the southern United States relied heavily on the use of slave labor: "The Virginia and Tennessee Railroad, in 1856, would have ranked the sixth largest plantation in Virginia, and the Southwestern Railroad in 1850 would have been the third largest plantation in Georgia."[14] A century of colonial brutality owes much of its existence to the necropolitical contours of the railways, and where anticolonial struggles were successful one still often finds the residue of colonial infrastructural violence.

Simultaneous with its pivotal material and ideological role in the construction of the early colonial period, the railway was integral to evolving artistic media of the epoch. Writer and painter Théophile Gautier described the railway stations where trains congregated as the new center of the universe: "These cathedrals of the new humanity are the meeting points of nations, the centre where all converges, the nucleus of the huge stars whose iron rays stretch out to the ends of the earth."[15] J. M. W. Turner's 1844 painting *Rain, Steam and Speed* exhibited an early fascination with railway mobility, the elemental force of steam power, and the confusion of the senses produced by new mobilities. When William Powell Frith's painting *The Railway Station* was exhibited in 1862 in a small art gallery next to the Haymarket Theatre, it attracted 1,000 spectators per day, and as many as 80,000 viewers in total; the painting's provenance and contemporary promotion made it a "leap of capitalist faith"[16] and an emblem of the railway's place in modernist iconography. By the time of Édouard Manet's 1873 painting *The Railway*, modernity's iconic machine could be invoked by nothing more than a cloud of steam behind a wrought-iron fence. Trains were not only a common feature of nineteenth-century literature, they also

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came to define the genre of literature, fiction and nonfiction, known as "railway reading," determined by the contemplative time of rail travel.[17] Lynne Kirby maps the railroad as both "preexisting and coexisting" with the birth of cinema; she connects the "train's representation in the cinema to the train's historical and ideological functions, to national differences, and to social-sexual factors bearing on an understanding of the train's popular representation."[18] Trains are also prominent in early cinema, such as the Lumière brothers' 1895 silent black-and-white documentary *L'Arrivée d'un train en gare de La Ciotat* (*The Arrival of a Train at La Ciotat Station*), and Kirby correctly associates a signature film camera movement, the tracking shot, with the technological apparatus of the railroad.[19] The "fundamental paradox" of the railroad experience, "simultaneous motion and stillness,"[20] parallels the illusion created by automobility, compared with the VR experience earlier in this book. As it contributed to colonial violence, the railroad became what Kirby calls a "*protocinematic* phenomenon, a significant cultural force influencing the emergence and development of the cinema during the silent period in both the United States and Europe."[21] The striations of the colonial apparatus produced sustained perceptual tendencies, not entirely surprising given the fact that both "cinema and the railway offer more or less predetermined and repeatable spatio-temporal continuities."[22] Perhaps it is no coincidence that revolutionary visions of derailment, such as in the film *Snowpiercer* discussed later in this chapter, coexist with the "slow cinema" movement, the long take as a historical counterpoint to the tracking shot and its embryonic futurism.

In Mbembe's definition of necropolitics, "the ultimate expression of sovereignty resides, to a large degree, in the power and the capacity to dictate who may live and who must die."[23] Building railways produces new forms of capitalist accumulation and surplus populations, from the dispossession of Indigenous people to the slave trade and modern extractive industries. As Patrick Wolfe famously described settler colonialism: "settler colonizers come to stay: invasion is a structure not an event."[24] The necropolitical force of the settler's railways in North America, South Asia, Africa, and elsewhere endures and poses an existential obstacle to Indigenous communities. Whatever else railways are for in settler societies, their primary purpose is always integrated with the settler "logic of elimination" and therefore in service of "access to territory."[25] The point here is not that Indigenous communities must refuse the railway, but that railways bisect and circumscribe

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Indigenous lands and continue the colonial project of resource extraction and the mobilization of state violence. "Settler colonialism destroys to replace," writes Wolfe. Decolonization might require the destruction of many railways, to disrupt the flow of capital and deny certain forms of state striation. For the contemporary liberal order, necropower depends on industrial infrastructure and its logistical comportment for the operation and extension of the suicidal state.[26] Railways, formerly the principal technosocial pillar of colonial militarism and capitalist accumulation, have ironically become symbols of "green" capitalism, a seemingly benign form of transportation when compared with more carbon-intensive alternatives such as cars and airplanes. The signature technology of celebrated capitalist Elon Musk, the Hyperloop underground transit system, may be a concept at least as old as the Beach Pneumatic Subway constructed in New York City in 1870, or the pod cars from the 1976 film *Logan's Run*, but variations of rail technologies now represent forward-looking infrastructure that is relatively clean, fast, and invisible. Hyperloops and high-speed trains continue the structure of settler colonialism and its logic of elimination, less carbon-intensive infrastructure that extends the deeply entrenched striations of centuries of colonial advances. Whether these railways, old or new, can be part of a decolonized future remains secondary to the necessity to slow and even reverse the ecocidal march of global capitalism in the coming decades.

As described by Michael Dillion and Julian Reid, so-called critical infrastructures within the liberal world order constitute essential elements of life under those regimes and are defended in the name of prolonging the technosocial regime instead of protecting human life.[27] For example, the reconstruction of Iraqi infrastructure after the war against the Islamic State will cost $45.7 billion, according to the World Bank.[28] Iraqi officials estimated the cost at $88 billion, at a 2018 conference in Kuwait attended by dozens of countries.[29] Relief for the human casualties of imperialist interventions are of little concern to global capitalism, but rebuilding critical infrastructure almost anywhere attracts corporate bids from around the world. Dillion and Reid also emphasize how the interconnectedness of global infrastructure systems provides a conduit for anxieties over their fragility: "Attacks on, or indeed the mere breakdown of, one infrastructure system . . . serve to increase anxiety about every infrastructure system and transnational infrastructures *tout court*."[30] This fear of infrastructural breakdown, a ruling-class

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concern probably mirrored in the population over which they rule, is especially severe for the ruling class because of its "acute appreciation that the capacity to govern is dependent upon the smooth and uninterrupted functioning of infrastructures."[31] In the context of the contemporary liberal order, therefore, human life matters primarily for logistical opportunities in the preservation and extension of infrastructure,[32] which reframes colonial priorities in terms that privilege the logic of elimination over the colonizers themselves. This is the end stage of colonization, the suicidal state form that privileges its own suicide over the lives of the oppressors, for colonialism would rather die than pass on a world in decline to the colonized. Colonialism would sooner end the world than end its reign.

Bwana Devil (1952)

The 1952 film *Bwana Devil* is loosely based on the building of the Uganda Railway in British East Africa, and its story of man-eating lions who attacked Indian migrants working on the railroad was filmed again in 1996 as the lamentable *The Ghost and the Darkness* starring Val Kilmer and Michael Douglas. *Bwana Devil* is more famous for its original audience than for its pioneering but flawed deployment of 3D effects. An image of the audience wearing 3D glasses at the premiere of *Bwana Devil*, taken by *Life* photographer J. R. Eyerman, later appeared on the famous cover of an English translation of Guy Debord's *The Society of the Spectacle*. Alberto Toscano and Jeff Kinkle explain the problematic legacy of the famous unauthorized cover:

> This image casts the theory of the spectacle as an ocular-centric discourse and suggests that life under its spell resembles the experience of sitting passively in a darkened cinema, living vicariously through the actions of the characters on screen, with the added indignity of wearing silly glasses. It directs struggle and critique to the world of leisure and consumption rather than production.[33]

For Debord, however, *The Society of the Spectacle* demonstrated "the autocratic reign of the market economy,"[34] its operation in every niche of everyday life, and he described the continuation of Western imperialism in Africa as "still the true master of the economy,"[35] an acknowledgment of the enduring politics of colonial infrastructure. The image of the *Bwana Devil* audience transformed popular perception of Debord's classic Situationist treatise into an attack on passive spectatorship, but little attention has been given to the film being watched by the audience in the photo.

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Why should the film matter? In part, because *Bwana Devil* draws our attention to the logistical and hyperindustrial base of modern capitalism. After 1968, much social theory lost sight of the machinery of territorialization and devoted extensive theoretical energies instead to understanding the intricacies of visual culture, including propaganda, public relations, advertising, television, and global screen culture more generally. The critique of screen culture is undoubtedly important, but with the Internet the interruption of screen culture becomes far more challenging; instead, critique and opposition to hegemonic visual cultures produce a dizzying array of optical noise in which intellectual clarity and sense of purpose are lost amidst the guttural braying of automated trolls and state-sponsored psy-ops. The infrastructural foundation that enables grid-driven computers and gas-powered vehicles to function, on the other hand, remains exposed and vulnerable to attack, generally not obscured by social detritus. Given a choice of trying to meme one's way out of late-stage capitalism or organizing to disrupt extractive industries and sabotage the pipelines, roads, and railways, the facile and popular response tends to involve a laptop and not a pickaxe.

Bwana Devil returns to the setting of colonial railroad construction. The Uganda Railway was one part of what poet and journalist Edwin Arnold first described in 1874 as the "Cape to Cairo Railway," a vision propagated by imperialist and white supremacist Cecil Rhodes but never fully realized. Construction of the Uganda Railway began in 1896 in Mombasa, a port city on the coast of the Indian Ocean, and finished in 1901 in Kisumu, on the edge of Lake Victoria. By 1901, British explorer and colonial servant Sir Harry Johnston reported that because of the Uganda Railway the territory it crossed was "admirably suited for a white man's country."[36] *Bwana Devil*, set in 1898, depicts some of the estimated 32,000 Indian migrants who worked on the railroad being killed by lions, which convinces the English engineers to bring in big game hunters. The hunters also fall to the lions, and it is up to the film's American hero, Bob Hayward (Robert Stack), to kill the lions, a climax of white settler heroism that overshadows the historical deaths of almost 2,500 workers during the railway's construction. *Bwana Devil* actually opens with a work stoppage on the railroad caused by a religious holiday, to which Major Parkhurst (Ramsay Hill), in charge of construction, declares, "A contract is a contract. They will work." Parkhurst assures Bob Hayward, the chief engineer, "You know, Robert, when the trains begin to arrive, civilization will arrive too." Hayward offers a standard colonial

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complaint: "Civilization. That's a noble word. Not enough to keep me rotting here." Between 1830 and the turn of the century, when the film is set, more than 965,000 kilometers of railway were constructed around the world.[37] The characters of *Bwana Devil* disparage their African context, but the railways built by migrant workers primarily served the purpose of transporting "heavy loads of coal and other minerals to rivers or the sea, and later to canals, where they could be transported for far greater distances,"[38] a colonial exploit that made possible the "civilization" to which the British and American in the film desire to return. Colonial rail assemblages continue to serve similar purposes over a century later, with many observers declaring the neocolonial project of a new "scramble for Africa."[39] While talk of a postindustrial age has consumed settler societies such as the United States and blinded some to the deeply entrenched mechanisms of capitalist accumulation, the hyperindustrial striations of ageing rail lines provide the foundational contours for the contemporary global petromodern energy regime. Long after the pinnacle of rail usage, almost 70 percent of US coal is carried by rail to its destination, and this is enough coal to power 78 percent of US homes.[40] According to the Association of American Railroads, "In 2012, trains [in the US] carried 40 times more oil than they did in 2008, and the volume doubled again in the following year, to about 400,000 tanker-car loads."[41] In 2018, the IEA projected that crude-by-rail shipments in Canada would more than double by 2019, from 150,000 barrels per day in late 2017 to as much as 390,000 barrels per day in 2019.[42] The government of China declared it would increase rail capacity for thermal coal by 150 million tonnes in 2018,[43] and India produces over 600 million tonnes of coal per year, most of which is shipped by rail. The image of an audience in 3D glasses, gazes cemented to the screen, may have seemed like an apt metaphor for life in the society of the spectacle, but the film they were watching, *Bwana Devil*, despite its racism and shoddy effects, draws our attention back to the brutal contours of hyperindustrial infrastructure.

One of the unfortunate consequences of the depiction of rail construction in *Bwana Devil*, however, is the way it focuses on lions and not the savagery of the British as the cause of the violent deaths of rail workers. When the British built railroads in India, for example, the death toll among "navvies" was "startling, reaching numbers normally seen only on the battlefield."[44] This makes the reaction of Commonwealth readers to the atrocities

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of the Burma Railway, discussed later in this chapter with reference to *Bridge on the River Kwai* and *The Narrow Road to the Deep North*, somewhat hypocritical. More broadly, infrastructure studies needs to pay more attention to the use of slave labor in the construction of infrastructure. Railroads in many nations were constructed by slave labor. In the United States, for example, "thousands of enslaved blacks worked on the railroads right up to and during the Civil War, grading lines, building bridges and blasting tunnels. They hauled timber, cut wood and shoveled dirt and stone. Skilled slaves, especially blacksmiths, stone masons and carpenters, worked on the railroads too."[45] While great American artists such as Harriet Beecher Stowe and Walt Whitman used the railroad as a symbol of progress, both its construction and its operation incorporated the use of thousands of slaves; in the words of historian William G. Thomas, "Railroads and slavery [in the United States] became fused in a relationship that reinforced one another."[46] As the rage for railways accelerated, the prices of slaves increased; some states, such as Virginia, turned to prison labor when slaves were unavailable. The expansion of the railroad system in the southern US also modernized the system of trafficking slaves. "If cotton was the engine of slavery's growth into the 1850s," writes Thomas, "then railroads constituted a second phase, equally merciless, exploitative, and disturbing."[47] In the decades preceding the Civil War, "railroads appeared to enhance slavery's social and economic potential at the very moment of its impending political eclipse."[48]

The railroads in the southern US enabled the efficient movement of slaves, who also could be used as collateral for loans to build more railroads. As discussed later in this chapter, slave labor from the Soviet gulags built many of the canals and highways constructed under Stalin.[49] During World War II, the Nazis forced an estimated 10,000 laborers from at least 37 labor camps to begin building the *Reichsautobahn*.[50] Closer to the present, Amnesty International accused the nation of Qatar of employing forced labor to build the infrastructure for the 2022 World Cup;[51] the International Trade Union Confederation estimates 4,000 migrant workers will die in the construction of tournament infrastructure before the 2022 World Cup, if no intervention is attempted.[52] The history of infrastructure and forced or slave labor deserves an extended consideration, certainly more than this brief interlude can offer, and such a study might consider the connections between authoritarianism and infrastructure, past and present. International Container Terminal Services, Inc. chairman and president Enrique

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Razon Jr., one of the richest men in the Philippines, remarked in 2017, "The countries with the best infrastructure in the world are dictatorships."[53] He qualified the comment by saying he was not endorsing a particular form of politics, but his sentiment probably reflects the orientation of most capitalists and other authoritarians. There are the obvious reasons authoritarians admire infrastructure projects: these projects tend to solidify social relations in ways that advantage the ruling class, and they simultaneously provide what Ingrid Burrington calls a "tremendous display of power."[54] But there has yet to be a study of the political economy of infrastructure projects and how they lend themselves to the use of slave labor. Similarly, infrastructure studies could use more dedicated research on the relationship between (antiauthoritarian) revolution and infrastructure.[55]

The Bridge over the River Kwai (1952)

Among the most famous infrastructure projects involving slave labor, the Burma Railway also represents a rare instance of infrastructural slave labor immortalized by notable artistic depictions. Electrical engineer, spy, and novelist Pierre Boulle authored *Le Pont de la Rivière Kwaï* (*The Bridge over the River Kwai*), which won the Prix Sainte-Beuve in 1952; it was adapted as the 1957 award-winning film *Bridge on the River Kwai*, directed by David Lean. A host of memoirs and memorials dedicated to the slave laborers who built this railroad appeared in the early 2000s, and Richard Flanagan's Booker Prize-winning novel *The Narrow Road to the Deep North* was published in 2014. This period of memorializing the dead who built the Death Railway also included films such as *To End All Wars* (2001) and *The Railway Man* (2013). The Burma Railway, the "Death Railway" that attempted to connect Ban Pong in Thailand to Thanbuyuzayat in Burma in 1942 and 1943, was an attempt to build 415 kilometers of railway using approximately 60,000 Allied prisoners of war and 200,000 Southeast Asian civilians as slave laborers. An estimated 12,000 POWs and 60,000 Asian civilians died under horrific conditions.

Narrative depictions of the Death Railway are connected by the ways in which the infrastructural object (the railway or the bridge) assumes agency, the railway "demanding" to be built. This centripetal force of the assemblage (territorialization) overwhelms centrifugal agencies (deterritorialization) and convivial potentialities. The novels under consideration

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here arrive at different "points," but infrastructure (the bridge, the railway) provides the centripetal acceleration for necropolitical vectors. In the novel *The Bridge over the River Kwai*, for example, the ideological framework of the narrative immediately recognizes the relativity of orientalist prejudice: "The insuperable gap between East and West that exists in some eyes is perhaps nothing more than an optical illusion."[56] And yet, of course, the sides of this conflict—so-called Allied and Axis powers—invigorate their speech with racist diatribes about the stoicism of British or Japanese "character," the sense of national purpose, and the existential crisis presented by the railway in question. "Saving face" was equally important to British and Japanese soldiers; the Japanese colonel, Saito, shared the same mentality, in that regard, as his British prisoner, Colonel Nicholson. Colonel Saito would have to commit ritual suicide if the railway were not constructed on schedule, and Colonel Nicholson and his men faced being worked to death—something they embrace, ironically, to prove British culture superior to its Japanese counterpart. Thus, the brutalities deployed by Japanese officers "were all as meaningless as the show of ponderous dignity which was Colonel Nicholson's favourite weapon, wielded as a mark of British superiority."[57] British imperialism could provide no form of superiority for British soldiers, attracted as it was to the same murderous brutality being applied to the British POWs, and the British soldiers recognize that their Asian peers in Singapore "had proved to be not much more oppressive than any Western army of occupation would have been."[58] Behind the enslaved labor on the Death Railway was something Colonel Nicholson recognized as familiar to "East and West alike": "racial pride, a mystic belief in authority, the dread of not being taken seriously, a strange sort of inferiority complex which gave him a jaundiced, suspicious outlook on life, as though he was in perpetual fear of being laughed at."[59] To the Japanese officers, the railway must be completed "to provide a way through to Bengal for the army which has liberated those two countries from European oppression. Japan needs this railway to continue her victorious advance, to enable her to overrun India and so bring this war to a rapid conclusion."[60] These socially constructed racist and authoritarian phantoms haunt oppressive structures around the world, accelerating the necropolitical tendencies of infrastructural assemblages. Boulle satirizes the British officers by making them prove British "superiority" by doing a stellar job of constructing the enemy's bridge, which demonstrates the futility of national and ethnic

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pride. At the end of the novel, a train carrying dignitaries is derailed by Allied commandos, but the bridge remains intact, as an attempt by British commandos to destroy it fails; in the film version, the bridge is destroyed when Colonel Nicholson, played by Alec Guinness, accidentally falls dead on a detonator set up by a Canadian lieutenant. Notions of pride and superiority literally implode with the bridge.

The construction of the bridge is managed by Major Hughes, a former director of a Malaysian mining company, and Captain Reeves, a public works engineer from India.[61] Notably, the British expertise in infrastructure engineering derives from colonial contexts. Colonel Nicholson sees the gradual manifestation of the bridge as "a living symbol of the fierce struggles and countless experiments by which a nation gradually raises itself in the course of centuries to a state of civilization."[62] He is so completely immersed in the nationalist imaginary and its racist dreamworld that he cannot bring himself to destroy the bridge for the strategic wartime aims of the nation, a paradox that not only satirizes the illogical mechanisms of nationalism but also traces the perimeter of the void into which the infrastructural necropolitical valences disappear. In the latter part of the novel, narrative emphasis switches from Hughes and Reeves and the effort to build a proper bridge to the commando force responsible for destroying the bridge. Joyce, a member of this force who used to design bridges in his civilian life, eventually sits in position to carry out the sabotage of the bridge. He must remain in position for an extended period of time, during which he drifts in and out of sleep, experienceing the fever-dream of an engineer once compelled to build bridges now being told to destroy one. This moment of brisantic conversion might be read by contemporary audiences in terms of the necessary social transformation we must undergo, from the delusions of the myth of progress to the eleventh-hour intervention of sabotage and social fragmentation. Joyce dreams of the job he held, sitting under a lamp with his drawing paper before him. But this image has a new heading superimposed on it:

> He tried in vain to decypher the letters. They were dotted all over his drawing-paper, until at last they fused together again, as sometimes happens at the end of a film on a cinema screen, to form a single word. It was the word DESTRUCTION, in heavy black letters written in shiny ink, which reflected the light of the projector-lamp and bewilderingly filled the whole screen, leaving no room for any other character.[63]

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On his own as the mission unfolds, Joyce no longer finds comfort in the standard motivations for destroying the bridge: "Hatred of the Japanese, sense of duty—these were ludicrous irritants which could not be expressed in a sufficiently clear form. He thought of his superior officers, of his friends who were relying on him entirely and who were now waiting on the opposite bank. Even that thought was not sufficiently real. . . . Even the intoxication of success was now of no avail."[64] Exorcised of conventional inspiration, Joyce's mind returns to his vision of the drawing paper:

> It was last night's vision: the sheet of drawing-paper under the projector-lamp; the countless designs for the girder on which the brown squares were superimposed and which were dwarfed by a heading endlessly repeated in huge shining letters: the word DESTRUCTION. . . . He felt that this alone was sufficiently consistent, sufficiently complete, sufficiently powerful to make him rise above the disgust and horror of his wretched carcase.[65]

The narrative trajectory of *The Bridge over the River Kwai* moves from the centripetal force of competing nationalisms, which draw soldiers and civilians into the necropolitical vortex of bridge and railway construction, to the individual psyche on the precipice of destruction, a personal and material unbecoming.

In *The Bridge over the River Kwai*, the bridge is not destroyed; the intense focus on the bridge and its attendant nationalist and racist vortices dissipates into an aftermath of placid objects and a flat ontology. As the attempt to destroy the bridge passes, its "shadow" fades, and it becomes "nothing but a lifeless, useless structure,"[66] part of "the anonymous material universe. This universe of earth, monstrous vegetation, water and mosquito-infested swamp was not perceptibly affected by this human contribution."[67] The source of so much horror becomes just another thing in a hostile world, and the discourses that worked to death thousands of humans for the construction of a railway that would be closed in 1947 subside with the ebb of hostilities.

The Narrow Road to the Deep North (2014)

Richard Flanagan's *The Narrow Road to the Deep North* revives some of the events and themes of *The Bridge over the River Kwai*, but Flanagan's novel pursues in greater detail Boulle's assertion that East and West are more alike than nationalists prefer to admit. Flanagan's novel definitely has more in

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common with Boulle's novel than with Lean's film. The stoicism of Colonel Nicholson in Lean's film, for example, is quickly dismissed in *The Narrow Road to the Deep North*. Flanagan introduces a British colonel named Rexroth early in the novel. Rexroth assures Dorrigo Evans, the Australian POW who becomes famous for surviving the Death Railway, "that their British espirit de corps would hold and their British spirit would not break and their British blood would bring them through it together."[68] Unlike the indelible cinematic characterization of British stoicism portrayed by Alec Guinness, Colonel Rexroth is presented as part of the absurd milieu of the Death Railway, a bootlicking fool who advises the slave laborers that "as members of the British Empire, as Englishmen, we must observe the order and discipline that is the very lifeblood of the Empire. We will suffer as Englishmen, we will triumph as Englishmen."[69] On the next page of the novel, Rexroth dies of dysentery and is buried "along with everyone else in the jungle."[70] Thereafter, the Australian Dorrigo Evans becomes the acting commander of the POWs.

The Narrow Road to the Deep North follows narrative contours similar to those found in *The Bridge over the River Kwai*: Flanagan's novel traces the racist groupthink, military objectives, and sense of national destiny that enfold masses of men to build a railway through the jungle, the misery and unspeakable suffering that define this project, and the aftermath, when the railway becomes irrelevant and the dead are just more dirt underfoot. Dorrigo Evans sees Major Nakamura, the Japanese commander of the POW camp, as "the terrifying force that takes hold of individuals, groups, nations, and bends and warps them against their natures, against their judgements, and destroys all before it with a careless fatalism,"[71] an apt description of the centripetal impetus of the railway as sociotechnical assemblage. One structural distinction in Flanagan's novel is the use of shifting narrative time and the subsequent emphasis on the postwar years. Boulle gestures at the fleeting nature of the horror witnessed on the Death Railway, but Flanagan extends the arc of time so that readers get a better sense of how an infrastructure project (and war crime) do not necessarily endure in the way one expects; or rather, that infrastructure endures in multiple cultural and material sites and capacities, not singularly as an object. While the focus of the novel is the story of Dorrigo Evans, the survivor of the Death Railway who becomes celebrated as a war hero, "the subject of biographies, plays and documentaries,"[72] *The Narrow Road to the Deep North* also depicts the

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postwar struggles of the Japanese officers, and in this way achieves a fuller representation of what Boulle called the "optical illusion" of the cultural gap between East and West.

At the heart of Dorrigo Evans's experience of the Death Railway is the brutal beating death of his close friend Frank "Darky" Gardiner, whom Dorrigo later learns was his nephew. Dorrigo tries to intervene in the beating but ends up negotiating with a Japanese officer to sacrifice Darky in order to save other POWs with a gift of quinine. "He could not help Darky Gardiner. The railway demanded it," Dorrigo reasons. "Nakamura understood that. Dorrigo Evans had to accept it. He too had a part in the railway. Nakamura had a part. Darky Gardiner had a part, and his part was to be brutally beaten, and all of them—each one in his own way—had to answer to the terrible drumming."[73] For slaves building this particular piece of infrastructure, there was no escape; Dorrigo's (and hence the reader's) perception of events telescopes potentiality into the confined space of fatalism, such is the momentum of this infrastructure assemblage. Dorrigo dismisses the murder of Darky Gardiner as a horrific necessity for the railway to exist.[74] Major Nakamura, in between alcoholic benders and doses of Philopon (methamphetamine), says through his interpreter, Lieutenant Fukuhara, that "progress has no need of freedom," also noting that the British Empire was built "sleeper by sleeper of non-freedom, bridge by bridge of non-freedom."[75] The two sides, masters and slaves, become prisoners of *post factum* justifications for war crimes in the name of the railway:

> All that mattered was the railway. As naked slaves to their section of the Line, with nothing more than ropes and poles, hammers and bars, straw baskets and hoes, with their backs and legs and arms and hands, they began to clear the jungle for the Line and break the rock for the Line and move the dirt for the Line and carry the sleepers and the iron rails to build the Line. As naked slaves, they were starved and beaten and worked beyond exhaustion on the Line. And as naked slaves they began to die for the Line.[76]

Flanagan uses the refrain "the railway demanded it" to capture the apparent inevitability of necropolitical infrastructure in the context of colonialism, war, nationalism, and structural racism. The "demand" is not only an illustration of object agency; it is also an exhibition of how such agency becomes contiguous with authoritarian discourses and institutions: "Nakamura knew many would die trying to get there. Perhaps most. But the railway demanded it, the Emperor had ordered the railway, and this was the

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way it had been decided that the railway would be made."[77] Colonel Kota justifies the use of slave labor under deadly conditions to construct the railway because war is "beyond" ethical concerns and the Burma Railway is an "epoch-making construction" with which the Japanese will become "the new drivers of world progress."[78] The railway is therefore not simply a military objective but a conduit for cultural domination.

These novels about the Death Railway portray culture as inextricable from the infrastructural project, something often forgotten by scholars in infrastructure studies (which this book attempts to rectify). Flanagan foregrounds the railway as a cultural production. The Death Railway was "made as much of myth and unreality as it was to be of wood and iron and the thousands upon thousands of lives that were to be laid down over the next year to build it."[79] In *The Narrow Road to the Deep North*, the railway is figured by Japanese officers as the "embodiment" of the Emperor's will[80] and a channel for the global spread of Japanese culture. Colonel Kota describes the haibun "The Narrow Road to the Deep North," written by seventeenth-century Japanese poet Matsuo Bashō, as a summation of "the genius of the Japanese spirit."[81] The poet and the railroad form an imperialist conjunction, in the minds of the Japanese officers:

> They were deeply moved . . . knowing the poem demonstrated the higher side of themselves and of the Japanese spirit—that Japanese spirit that was soon to daily travel along their railway all the way to Burma, the Japanese spirit that from Burma would find its way to India, the Japanese spirit that would from there conquer the world. In this way, thought Nakamura, the Japanese spirit is not itself the railway, and the railway the Japanese spirit, our narrow road to the deep north, helping to take the wisdom of Basho to the larger world.[82]

On the Allied side, Dorrigo admires the poetry of Tennyson. Flanagan proposes an ambiguity in the progressive possibilities of literature: the veneration of acclaimed literature does not guarantee ethical behavior. In this case, great literature becomes an avatar of mass murder. But Japanese literature also functions in the novel as an imaginary counterpoint to the lethal materiality of the railway, which is often referred to as the Line. When the eighteenth-century poet Shisui died, he painted a circle. His death poem, or *jisei*, "rolled through Dorrigo Evans' subconscious, a contained void, an endless mystery, lengthless breadth, the great wheel, eternal return: the circle—antithesis of the line."[83] The circle—the void of existence—contrasts with the many certainties associated with the Line: the omniscient will of

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the Emperor, the arrogance of nationalism, and the brute force of military administration. With the end of the war, the Line "began welcoming its own end."[84] The agency of the railway, for a brief time a tyrannical, necropolitical demand, quickly dissipates into vortices of unbecoming: "The Line welcomed weeds into the embankments the slaves had carried as dirt and rock in their tankas, it welcomed termites into the fallen bridge timbers the slaves had cut and carried and raised, it welcomed rust over the railway irons the slaves had shouldered in long rows, it welcomed rot and ruin."[85] The metaphors of line and circle eventually culminate in exposing the lie of the endurance of infrastructure, the promise that the politics of infrastructure are concretized for eternity, that these built structures transcend death: "For the Line was broken, as all lines finally are; it was all for nothing, and of it nothing remained."[86] The railway and literature are part of a reciprocal exchange on the horrors of slavery, memory, empire, and the transience of life and infrastructure.

The Death Trains of the Holocaust

The first black-and-white image in Steven Spielberg's *Schindler's List* (1993) captures the steam of a locomotive arriving at Kraków Główny railway station, which finished construction in 1847. The black-and-white footage obviously invokes newsreel footage, and the locomotive has become synecdoche for Holocaust horrors. "If there exists an Auschwitz code, enabling us to speak after and about the Holocaust," writes Wojciech Tomasik, "railway images seem to constitute its core."[87] High-speed passenger trains built prior to the war provided the Nazi regime with a modernist sheen.[88] When World War II started, the Deutsche Reichsbahn (DRB) became an essential logistical component of the Nazi war machine. According to a 2019 study by mathematical biologist Lewi Stone—who used railway transportation records to measure the intensity of the killing at the height of the Nazi Holocaust during Operation Reinhard, a period of 100 days in 1942—the "singularly violent character" of the Holocaust achieved its exceptional "kill rate" as "an outcome of having the key death camps operating simultaneously for a period, supported by the railway system to rapidly transport Jewish victims to the camps."[89] From August to October 1942, approximately 450,000 Jews were killed each month, a killing intensity 80 percent greater than that of the Rwandan genocide, a contemporary genocide often

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considered to have experienced the most intense period of killing. Without the participation of the DRB, argues Alfred C. Mierzejewski, the Holocaust would have been unachievable:

> The Deutsche Reichsbahn was involved in the Nazi program of persecution of the Jews from beginning to end. Without the provision of transport by the Reichsbahn, the Holocaust would not have been possible. About half of the Jews who died at the hands of the Nazis were brought to their deaths by the DRB. . . . The Reichsbahn cooperated fully with the Nazi regime to remove Jews from its own ranks. Prior to the outbreak of the war, it also participated in the program of intensifying discrimination against the Jews.[90]

The ghettos created by the Nazis were deliberately constructed near railway connections, and the concentration camps aligned with rail lines and concealment from the public.[91] In addition to the hundreds of thousands of Jews who were transported to concentration camps, even more were moved to the eastern front and executed.[92] Mierzejewski contends that Albert Ganzenmüller, the Undersecretary of State at the Reich Transport Ministry, indisputably "was fully aware of the Jewish special trains and their purpose."[93] For historian Christopher R. Browning, the evidence shows "railway men at all levels knew precisely with whom they were dealing and what they were doing."[94] One reason the DRB could almost effortlessly participate in the Holocaust was the minimal impact the death trains had on regular rail traffic, resulting in little attention being paid to the operation of the genocidal machinery.[95]

The history of the Holocaust at first overlooked the importance of the German railroads to the execution of genocide. In 1976, Raul Hilberg addressed this omission of what he called "an important clue to the nature of totalitarianism and the manner in which it may function."[96] Hilberg saw the railway system in general as "a major factor in the growth of modern authoritarian government,"[97] but his essay was the first substantial intervention on the subject in Holocaust history. As others who followed him would assert, he situated the railroad "not on the fringe" of the Holocaust but "indispensable at its core."[98] The death trains carried the belongings of death camp victims to Germany for distribution in addition to transporting prisoners to the camps, and the trains were financed by expropriated Jewish property and the forced contributions of Jewish communities in Germany.[99] Hilberg describes the railroads as occasional "consumers as well," exploiting forced Jewish labor and claiming some of their stolen

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goods.[100] The multifaceted system of death trains provided historians with "profound questions about the substance and ramifications of the entire Nazi Reich."[101]

While the death camps were primary killing sites in the Holocaust, Simone Gigoliotti argues forcefully for a "hidden Holocaust" inside the transport trains themselves.[102] Gigoliotti describes the death trains as "experiential breaks from the ghettos and camps"[103] that deserve greater attention as locations of "spatial and somatic trauma." The genocidal circuits of the death trains "are a grim testament to modern state-sponsored practices of isolation, exclusion, and ethnic cleansing."[104] In his novel *The Death Train* (1978), Christian Bernadac represents the journey of the death train 7909 from Compiègne to Dachau. Bernadac provides, through the dialogue of a prisoner, a vivid sense of the deadly conditions of the train car in which prisoners were drinking their own urine to survive, and only three out of 100 prisoners, in one particular journey, arrived alive:

> "They closed us up in here to kill us off. They're going to ride us around until we all croak. In Compiègne they packed one hundred of us into a single car. Here there are only three of us left alive, and in the other cattle cars, maybe they're all cooked already. They did it on purpose. They wanted us to start fights. There's no air in here. That's on purpose too. I'm telling you: this train is the death train. Not one of us will get out of here alive. You see?"[105]

At the back of Bernadac's book, he lists the names of the 536 dead and 1,630 survivors of the convoy of July 2, 1944, the subject of his novel. Throughout the novel, Bernadac also provides references to historical documents. The effect is akin to what Hayden White describes in his discussion of Primo Levi's *Survival at Auschwitz*, "to demonstrate to his readers the difference between a merely truthful account of an event, of the kind provided by most survivor-witnesses, and an artistic treatment of a real event in his past which transcends the truth-reality distinction."[106] Gigoliotti uses witness testimony to demonstrate that the "sensory invasions" of the death trains sometimes exceeded the "degradations of the camp world."[107] For Jewish victims, this form of "forced transit" possessed a particularly powerful form of material reverberation because of their collective history of diasporic conditions.[108] Gigoliotti extends her conclusions about the deportation journeys of the Holocaust as ways to engage with other examples, historical and contemporary, "of the displacement of colonized, indigenous, and oppressed populations."[109]

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The rail lines of the Holocaust, integral to the Nazi genocide, compelled historians to debate for decades whether the Allies should have, or could have, bombed the concentration camps or the railways servicing them and thereby reduced the number of victims in the Nazi genocide. The general answer to this historical hypothetical, provided by historian Michael J. Neufeld, is a reminder that substantial necropolitical assemblages rarely can be undone by a single act of sabotage or attack:

> As for railway bombing, it was entirely natural that the Slovakian underground wanted the Allies to cut the lines on which the death trains from Hungary were moving. However, this task would have been extremely difficult at the ranges involved. Tactical air power was not available in profusion, and the odds of heavy bombers cutting rail lines and knocking out bridges were very poor. Attacking a town with marshaling yards en route might have offered a slightly better chance. But rail lines and some bridges could have been repaired easily by German crews, and deportation trains diverted to other routes, as the Nazis did not care what happened to the individuals inside. Readers may make up their own minds, but I believe that *at best* the pace of deportation might have been slowed slightly if the Allies had attacked while the Hungarian trains were still moving; however, this was nearly impossible as the appeals did not even reach the top leadership in the West until about the time the Horthy government ordered a halt.[110]

While the tactics available to slow or stop the Holocaust remain specific to historical and ideological realities, such historical atrocities can offer lessons for contemporary mechanized death on a massive scale: the industrialized global slaughter of nonhuman animals; the diffuse horrors of anthropogenic climate change; the pervasive despair generated by biodiversity loss; the irreversible metamorphosis of life in the Anthropocene. At the very least, the historical counterfactuals surrounding the Holocaust might compel contemporary struggles to register the affective awareness of brisantic failures, the sadness and disgust produced by necropolitical machinery run amok. Another way of putting this: How can art mediate remembrance of genocidal infrastructure, in this case the death trains? Or, as Todd Presner poses the question in his analysis of W. G. Sebald's novel *Austerlitz*, "How can the artificial, the fictional, the contingent, and the imaginative contribute to the extension of both memory and historical knowledge without in any way impugning survivors' memories and historical truth?"[111] In *Austerlitz*, the memory of the Holocaust mingles intimately with the architecture of the railway stations of Europe. The novel's German narrator becomes friends with a Jewish man who was dispatched on the *Kindertransport* by his

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family before they were killed in the Holocaust. Sebald himself was born in May 1944, toward the end of the war, and his novel approaches memory and the Holocaust from the perspective of those who lived after the events of the Holocaust, whose memories of it are necessarily based on the ruins of history and not firsthand experience. *Austerlitz* is framed by railway stations: the novel begins in the Central Station of Antwerp and ends at the gare d'Austerlitz of Paris. Presner sees this use of the railway system as "the figure par excellence of the dialectic of German/Jewish modernity—its emancipating freedom and its coordinated destruction—but it is also the material condition of possibility for conceiving of this modernist practice of representation and thereby reimagining both memory and history."[112] The railway in *Austerlitz* becomes synecdoche for the Holocaust and for epistemology. For Sebald, language cannot match the eyewitness experience of mass destruction; but the work of fiction can provide an assemblage of historical remains—from photographs and letters to railway stations and bunkers—through which the author and readers can begin to recover memories of the event.[113] The Jewish character in the novel, himself named Austerlitz, performs "the struggle to find traces of his past in the present."[114] Austerlitz has an "obsession with railway stations," connected to his own experience of the *Kindertransport* and his parents' tragic end in the concentration camp; the Paris stations are "places marked by both blissful happiness and profound misfortune," the modernist dialectic to which Presner refers.[115] The railway stations embodied the imposition of industrial time, what Austerlitz calls "by far the most artificial of all our inventions,"[116] but the railway lines that mark Austerlitz's journey look like "muscles and sinews in an anatomical atlas"[117] and yet also seem to run "away into infinity."[118] The contradictions of *Austerlitz* accumulate but always return to the railway and its formative reciprocity with the Holocaust:

> I studied the maps of the Greater German Reich and its protectorates, which had never before been more than blank spaces in my otherwise well-developed sense of topography. I traced the railway lines running through them, felt blinded by the documentation recording the population policy of the National Socialists, by the evidence of their mania for order and purity, which was put into practice on a vast scale through measures partly improvised, partly devised with obsessive organizational zeal.[119]

Austerlitz does not offer a definitive epistemological declaration for art or history, but traces the refractory dynamic of art and infrastructure, the

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interactive semiomaterial processes resistant to becoming mere formalism or deterministic materialism. The death trains of the Holocaust—shot through with the Nazi "mania for order and purity" but partly "improvised"—reveal a topography of genocide that provides a conditional warning and not a programmatic premonition.

Simultaneous with the Holocaust, the Soviet Union operated a railway network within its Gulag system for political prisoners and others deemed criminal. The absence of cameras filming the horrors of the Soviet forced labor camps meant a paucity of historical and popular representation after they were exposed.[120] During its peak years of operation, from 1929 until 1953, approximately 18 million people endured the Gulag system of the Soviet Union.[121] The Gulag was an integral component of Soviet industrialization, providing labor for major infrastructure projects, but infrastructure such as roads had been built by prison labor and slaves in Russia since the eighteenth century.[122] In her discussion of work on the Baltic-White Sea Canal, a major infrastructure project built by a prison labor force of over 175,000 and finished in 1933, Andrea Pitzer identifies the sociotechnical nexus of culture and infrastructure evident during its construction:

> At times it seemed as if nearly as much energy was expended on glorifying the effort as on actually digging the canal. Daily contests were held between brigades to see who could excavate the most. There were artistic contests, too, with financial rewards for the best artistic production about the project. The winning play recounted the tale of an English journalist who comes to the worksite expecting to see horrific conditions, but instead is so inspired by what he finds that he decides to stay.[123]

As with so much state-sponsored art for or about infrastructure, the "artistic contests" in this camp produced outrageous erasure of the infrastructure's necropolitical reality. In an instance of unintentional self-criticism, US vice president Henry Wallace visited the Kolyma region in the Russian Far East in May 1944 to see the largest and deadliest Soviet concentration camp in Magadan and compared it with the Tennessee Valley Authority, the worst elements of the camp concealed from his inspection. An estimated one million prisoners worked in Kolyma, with no accurate count of the dead available to historians.[124]

Of the artistic portraits of Gulag life that exist, of course Aleksandr Solzhenitsyn's *The Gulag Archipelago* (written between 1958 and 1968) is surely the most famous. *The Gulag Archipelago* somewhat resembles *Austerlitz*, in

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that the composition is a mixture of reportage, historical documentation, and literary imagination. Solzhenitsyn describes the "zak cars," or prisoner railroad cars, that travel from port to port of the Gulag Archipelago.[125] The "tormented hearts" of the zak cars travel "the same snaky rails, behind the same smoke, past the same fields, posts, and haystacks as you, and even a few seconds sooner than you."[126] The "obsessive organizational zeal" of the Nazis appears in the Gulag railroad, which runs on a schedule and reproduces "the familiar life of the train, which is always exactly the same" in most of the cars.[127] The death trains of the Gulag, like those of the Holocaust, developed in part by improvisation based on historical contingencies, which Solzhenitsyn describes with reference to the 1888 painting by Nikolai Yaroshenko, *Life Is Everywhere*:

> As far back as 1896, Lenin traveled to Siberian exile in an ordinary third-class passenger car (with free people all around him) and shouted to the train crew that it was intolerably crowded. The painting by Yaroshenko which everyone knows, *Life Is Everywhere*, shows a fourth-class passenger car re-equipped in very naïve fashion for prisoner transport. . . . However, it really became the favorite means of prisoner transport only in the twenties; and it became the universal and exclusive means only from 1930 on, when everything in our life became uniform. Therefore it would be more correct to call it a *Stalin* car rather than a *Stolypin* car.[128]

Yaroshenko's painting exhibits compassion for the prisoners being exiled to Siberia. A young child in the painting drops bread crumbs for a small group of pigeons at the train station, and the rest of what is presumably her family and other prisoners look on. The painting, like many survivors' memoirs, reminds us that even in the most despairing situations involving systemic torture and death there can be remnants of resilience, though irrepressible defiance does not necessarily take the form of organized, sustained resistance. Solzhenitsyn compares the inside of a zak car to a menagerie, except that the human menagerie—"huddled there in cages, the floors and bunks surrounded on all sides by metal grilles, looking out at you pitifully, begging for something to eat and drink"—is more crowded than its nonhuman counterpart.[129] Despite the inhumane conditions of the zak cars, Solzhenitsyn notes sardonically, "A sentenced prisoner is a laboring soldier of socialism, so why should he be tortured? They need him for construction work."[130] The infrastructure assemblages of the Soviet Union, and of so many other nation-states throughout history, have depended on slave labor for their modernist monuments. In the case of the Soviet Union, the

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Gulag of Stalinist modernization betrayed the socialist revolution (already betrayed by Lenin) in a manner that produced vestigial political economies, architectures, and ecological damage from brisantic failure. Like the death trains of the Holocaust, the trains of the Gulag system provide historical referents for assessing brisantic strategies against contemporary and future death train assemblages.

Snowpiercer (2013) and *Train to Busan* (2016)

Bong Joon-Ho's *Snowpiercer* (2013) and Yeon Sang-Ho's *Train to Busan* (2016) are death train narratives that depict revolutionary themes from opposite ends of the revolution: *Snowpiercer* tracks the violent upheaval of a proletarian mob assigned to the impoverished end of a train circling the globe after a cataclysmic event has plunged the planet into a perpetual freeze; and *Train to Busan* imagines a zombie plague from the perspective of mostly bourgeois train passengers who first believe the societal disruption is being caused by a general strike. Both films work within the parameters of their respective genres—postapocalyptic and zombie horror—to represent the possibilities and constraints of revolutionary praxis within the paralytic environs of infrastructural brutalism, and both films confine most of the action to a train with a fatalistic destination. In the case of *Snowpiercer*, the train must stay on track for a continuous journey, else the passengers risk the inhospitable climate of a world transformed by geoengineering run amok; for the passengers in *Train to Busan*, their destination, Busan, has been overrun by the zombie hordes, and the humans on the train are being overwhelmed by the spread of the zombie virus. In both films, the existential crisis that envelops the train combines with a class struggle on board. The films' revolutionary imaginary presents railway infrastructure as a delimiting materiality instead of an inherently liberatory one, and class struggle as occurring within the infrastructural limitations, not external to them. In other words, the revolutions in these films portray railway infrastructure as something to be overcome rather than an inherently progressive element of antiauthoritarian struggles. Unlike much contemporary theorizing of technology, for example, which often proposes technological affordances more politically flexible than they typically are, *Snowpiercer* and *Train to Busan* consider modern infrastructure as a prominent barrier for the existential crises of anticapitalist struggles.

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In the film version of *Snowpiercer*, a geoengineering attempt to curb global warming backfires and produces a frozen planet. In the graphic novels on which the film is based (a series of four volumes in French begun in 1982, later translated into three volumes in English), the origin of the natural catastrophe that covers the world in ice remains ambiguous. The difference is significant and part of what signals the film's more pessimistic attitude toward the liberatory potential of technology. Another important difference between the graphic novel and its adaption is the origin of the Snowpiercer train: in the graphic novel, we are told the train "was a pleasure train before the catastrophe," designed "to be fully self-sufficient, without scheduled stops or resupply, for weeks at a time," features that "probably" saved the lives of those on board.[131] In the film, the train exists in anticipation of the catastrophe, or at least as a precautionary measure in case of *a* catastrophe. Rather than a bourgeois entertainment that accidentally becomes the ark for survivors of the apocalypse (as in the graphic novel), the train becomes the creation of a singular engineer, Wilford, who responds technocratically to impending extinction. The train is more specifically born of technofuturistic survivalism, like an expensive bunker curated by a Silicon Valley CEO in New Zealand.[132] This choice also aligns the film against technocracy and the social class it serves.

In the graphic novels, the passengers gradually learn of additional Snowpiercers circling the globe; in the second volume, it is revealed that the Snowpiercer at the center of the narrative has collided with another Snowpiercer.[133] Fear of another collision, more than of the climate outside the train, becomes the central existential crisis for the passengers: "Since then, they've used people's fear of a head-on collision to control them. . . . They believe that without that fear, all those poor fools in the tail would have killed themselves long ago."[134] By the third volume, the new reality incorporates ten Snowpiercers, three of which are missing, seven of which have ended their journey in a settlement of sorts beneath a nuclear reactor.[135] A group of survivors decides to leave the settlement because radiation from the plant is poisoning everything. Once again, the sociotechnical assemblage that sustains human life is also destroying it: "If you follow us, I won't promise anything," declares an exile. "But what's keeping you alive is also killing you. You depend on a power source that is devouring you and devouring your children. The plant will be your death."[136] In the central dynamic of the *Snowpiercer* stories, from graphic novel to film, technosocial

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fatalism is portrayed as the force that prevents a revolutionary break: Leave the train, and you die; if the train stays on this track, it will hit another train and all will die; stay in the compound beneath the nuclear reactor, and everyone will eventually die from radiation poisoning.

Gerry Canavan describes *Snowpiercer* as an instance of "necrofuturism," the "endlessly rehearsed landscape of death and disaster that dominates contemporary visions of the coming decades."[137] For Canavan, necrofuturism produces a fatalistic vision of "a coming disaster we can anticipate but not prevent."[138] While acknowledging the "radical *constructedness*" of the capitalist market system and its outcomes, necrofuturism nonetheless commits the subjugated to a belief in the inevitability of their apocalypse.[139] In the anticapitalist allegory in *Snowpiercer*, the death train provides passengers with what is presumably their only form of survival; simultaneously, the train is a by-product of the capitalist order that killed the world, and within the train the surplus population relegated to the abject conditions of the rear car are ensured premature death, their only value to the Snowpiercer being their production of children capable of replacing an essential component of the engine that has since gone extinct. The allegory of the death train in *Snowpiercer* encompasses all of industrialized society and "names our deflationary belief that the conditions of exploitation and extraction that make contemporary society 'function' are foundationally unsustainable and thus manifestly have no future, and yet despite this fact they will simply not be altered in any way, even if it kills us all."[140] Canavan suggests that the graphic novel version of *Snowpiercer* exposes the constructed, historical nature of capitalism, and thereby makes evident the possibility that we could change course: "The comic makes us recognize the necrofuture is not an immutable law of the universe to which we are hopelessly doomed. It is instead the terrible future that the people in power have planned for us, and are at every moment deliberately bringing into existence—which means, by the same token, it is a future *we* might yet choose *against*, a freight train with a head of steam but one that we can yet derail."[141] Canavan's interpretation of *Snowpiercer* is largely correct, but his opposition of fatalism to boundless choice does not adequately describe the situation in which the oppressed find themselves. Some aspects of the attenuated disaster in progress cannot be reversed. Some qualities of the unprecedented destruction caused by humans can only be slowed; a soft landing might be possible instead of a crash. There *will* be a measure of sea level rise in the

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coming decades. There will be a certain amount of global warming, given the greenhouse gas emissions that have already happened. In addition to some inevitable environmental collapse, the forms of retrofitting and salvaging available to us are not infinite; the sociotechnical assemblages that made possible this world of concrete, steel, and steam also defined many of the constraints for possible futures. While *Snowpiercer* exposes the illusion of capitalist realism, it does not offer much in the way of remedies to this dire situation. However, it does perhaps offer the most important tactic for a departure from capitalist suicide: the train must be derailed.

Canavan does not read *Snowpiercer* with the same sense of realism that I am applying here. For him, the entire story is so absurd that one should not derive actual tactics from it: "*Snowpiercer*, it seems to me, is plainly about this effort of the imagination; neither the setup nor the climax is really amenable to any sort of realistic analysis about the practicalities of the situation. The whole thing is genuinely preposterous from start to finish. The point of the film is not to work out the inner logic of some possible future but rather to disrupt our guilty comfort and our comforting guilt about the actually-existing system we all know is terrible but think we cannot oppose, only wring our hands about and be more beautiful than."[142] But this interpretation denies *Snowpiercer* its articulation of the infrastructural brutalism that dominates the real world. If *Snowpiercer* were "genuinely preposterous" and so abstracted from actual material conditions that it could only operate as an intellectual exercise for allaying the guilt experienced by some, then it could not work effectively as a political allegory; but it does so, and the reason it does is because its depiction of class struggle within a technofuture produced by capitalist logics resonates so comprehensively with actually existing capitalism. Even if most people cannot imagine a future outside of capitalism, that lack of imagination no longer constitutes the urgent necessity of contemporary radicalism; the real challenge, given the advance of ecological collapse, is for a militant minority to cause enough destruction that ecocide is delayed and time for creating some kind of transitional economy is created. First, derail the train; then figure out life after capitalism. In this respect, *Snowpiercer* depicts applicable praxis.

Marx called revolutions the "locomotives of history," a humanist metaphor that diminishes too much the agency of nonhuman animals and objects. Benjamin's interpretation of the metaphor seems more appropriate for the contemporary condition: the revolution will be the passengers

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pulling the emergency brake, a still-too-humanist image but one that recognizes "the train" as something that must be part of a Great Deceleration and not something that should be commandeered intact. "All past revolutions failed because they couldn't take the engine," Curtis says with confidence at the beginning of *Snowpiercer* the film. Many analysts frame the structure of the train as an obvious allusion to a society stratified by class, and the revolt led by Curtis as a Marxist attempt at seizing the means of production (in this case, the engine that invigorates the means of production on board). If the engine functions in this allegory as a surrogate for the state—and given the indoctrination process we witness involving children pledging their allegiance to Wilford and the engine, this analogy seems accurate—then the revolutionary lesson of *Snowpiercer* is more anarchist than Marxist. To "take the engine" might be read as synonymous with "seizing the state," which makes Curtis more of a Marxist; he also tells his comrades, "We'll be different when we get there [the engine]." Thus, Curtis believes that a revolution should involve seizing state power, and he does not think possession of state power will alter the intentions of the revolutionaries, who will behave unlike their existing authoritarian leaders. This sounds like generations of Marxists, and *Snowpiercer* reveals the error of Curtis's strategy in the final act of the film. Not only was the revolt actually supported by Wilford and his accomplice Gilliam, but seizing the engine was revealed as a horrendous miscalculation that Namgoong Minsu, the security specialist, and his daughter Yona correct by setting off an explosion using toxic waste that doubles as a synthetic drug, Kronole. The explosion causes an avalanche that derails the train. The only visible survivors are the youngsters Yona and Timmy, and they are confronted by a polar bear outside the wreckage of the train. The ending of the film is more ambiguous than that of the comic, but one thing about the film is certain and affirmed by the ending: Curtis was delusional in his pursuit of the engine, and the film is clearly advocating a risky future outside the train instead of replicating the authoritarian technosocial order inside the train. This refusal of the Marxist strategy of seizing state power—which historically has repeatedly ended in totalitarianism and mass murder, in the Soviet Union, China, and Cambodia—would seem to put the film's ideological trajectory more in line with anarchist conceptions of revolution. Anarchists, of course, disagreed with Marxists over the principle of seizing state power in a revolutionary situation. Bakunin famously declared, "the people will feel no better if the

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stick with which they are being beaten is labeled 'the people's stick,'" an admonition of the inherently abusive quality of state power.[143] Not all anarchists are opponents of industrialization, of course, but the anarchist vision of revolution has always been opposed to the Marxist "dictatorship of the proletariat."

Train to Busan works within a similar milieu—the confined quarters of a train—but here the existential crisis outside the train is a viral zombie invasion. Instead of portraying the passenger revolt primarily from the perspective of the proletariat, as in *Snowpiercer*, *Train to Busan* witnesses events from the perspective of Seok-Woo, a divorced fund manager, and his daughter Soo-an, who are on a train to see her mother. When news of the social chaos breaks, Seok-Woo speaks with his office assistant for details. His first assumption is that the chaos is part of a strike. TV news reports that the chaos is nationwide. "I don't know what's happening," says the assistant over the phone. "But it's not a simple strike." When it is revealed that a company being financed by Seok-Woo's operation, YS Biotech, is the source of the virus, Seok-Woo asks, "Is this my fault?" Unlike most zombie apocalypse films, *Train to Busan* does not reward the most selfish characters; in fact, greed and selfishness are punished, and altruistic behavior is often rewarded. The class divisions inside the train are explicit: the real villain of the film is the COO of a company called Stallion Express, Yon-suk, who repeatedly puts others at risk to increase his chance of survival. By contrast, Seok-Woo undergoes a transformation from work-addicted capitalist who ignores his daughter to selfless hero who sacrifices himself—only after he has been infected by the virus, notably—to save his daughter. In this transformation, Seok-Woo befriends Sang-hwa, a burly man with a pregnant wife, Seong-kyeong. When Soo-an tells Sang-hwa that her father is a fund manager, Sang-hwa turns to his wife and declares, "He leeches off others." Soo-an castigates those who exhibit selfish behavior, and she is aware of her father's flaws: "You only care about yourself," she tells him. Similarly, Seok-Woo, Sang-hwa, and other passengers collaborate with a homeless man who sneaks aboard the train in their attempt to survive the zombie attack. Whereas *Snowpiercer* focuses on the revolt of the proletariat from the back of the train, *Train to Busan* emphasizes the redemption of a capitalist in the context of societal collapse. This redemption is a form of what Amilcar Cabral called "class suicide," at least in a very narrow sense, because Seok-Woo aligns himself with those who are outside and

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against his socioeconomic class (primarily with a wrestler, Sang-hwa, and a nameless homeless man). This might be too generous a reading, of course, because Seok-Woo only sacrifices his class interests, and later his life, under extraordinary circumstances, and his redemption is framed predominantly as a transformation of his relationship with his daughter.

Both *Snowpiercer* and *Train to Busan* feature popular revolts in the confines of a train and the striation of railway tracks. Both films situate infrastructure in (post-)apocalyptic conditions, and as the principal arbiter of revolutionary possibilities. In *Snowpiercer*, the passengers manage to derail the train. In *Train to Busan*, the passengers first attempt to deboard the train at Daejeon; when they discover the station has been overrun by zombies, they retreat to the train. The track is blocked at East Daegu station, so the passengers must leave the train and search for new transportation. The conductor starts a train on a different track, before he is eaten; and this runaway train, essentially, becomes the milieu in which the final confrontation between Seok-Woo, Soo-an, and Seong-kyeong and the corporate tyrant Yon-suk takes place. There exists a certain parallel, therefore, between *Snowpiercer* and *Train to Busan* and the ways in which these films conclude by isolating their heroes with the engine of a train (the Snowpiercer is of course not out of control in the same sense as the train heading for Busan, but in both cases the trains have nowhere to go but where the singular track will take them). In both films, the individuals assumed to be the heroes are undermined: Curtis discovers the revolution he led is a fraud, and he learns the truth about the exploitation of children necessary for the engine to continue; and Seok-Woo becomes infected by the zombie virus, so his redemption can no longer end by his being reunited with the young daughter he ignored in favor of his work. Both Curtis and Seok-Woo die in the final act, but their sacrifice allows others to survive. The agency of these patriarchal figures realizes its greatest libertory potential in what is essentially self-destruction. While Curtis occupies Wilford and the engine car, Namgoong Minsu and Yona manage to apply the Kronole to the door that leads outside. The subsequent explosion derails the train. Seok-Woo defeats Yon-suk in a struggle for the engine, then jumps off the train as he turns into a zombie and relives memories of time spent with his daughter. As a result, Soo-an and Seong-kyeong survive the trip to Busan, where they encounter soldiers guarding the perimeter of the station. The survivors in these films mirror the self-sacrifice of the patriarchs: in *Snowpiercer*,

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Namgoong Minsu's teenage daughter Yona and the young African child Timmy survive the crash, wander into the frigid wasteland dressed in garb that identify them as Inuit, and encounter a lone polar bear, perhaps a sign that life can exist outside the train. In other words, from the death of the white, patriarchal, technophilic order arises a new form of postapocalyptic Indigeneity. In *Train to Busan*, both of the central capitalist characters, Seok-Woo and Yon-suk, die, and two women, one pregnant, survive. The implications of the conclusion to *Train to Busan* are less dramatic than the stark ending of *Snowpiercer*, but the symbolism suggests the possibility of an emerging postcapitalist, postpatriarchal order; or, to read the ending in a less extravagant manner, one could posit the survival of Soo-an and Seong-kyeong simply as an affirmation of matriarchal and anticapitalist politics. The radical politics imagined briefly by these two films, in the context of infrastructural brutalism, conjoins the existing technosocial order with capitalism and patriarchy, at the very least, and portrays the end of the line as the last stop for a specific assemblage of necropolitical valences that have been riding the rails for over a century and a half.

The contemporary death train in the real world is *el tren de la muerte*, the network of trains that traverse Mexico on the way to the United States, and upon which migrants ride to escape various violent oppressions further south. As many as half a million migrants ride on top of these death trains every year, from Central America to the United States, through a gamut of threats that range from accidental injury to extortion, gang rape, and death. Represented in Cary Joji Fukunaga's 2009 film *Sin Nombre*, the 20-day journey through Mexico with little food or water on the freight trains known as *La Bestia*—"cargo trains transporting a variety of products to the United States, including food, automobiles, transportation equipment, cement, chemicals, and plastics"[144]—carries vulnerable populations fleeing violence and political persecution to the United States, where they must face the violence and persecution of border authorities. In 2014, the Mexican government increased patrols to make it more difficult to board the trains, and the trains were ordered to increase their speeds, but migrants continue to risk their lives on them. Much of the precarity migrants are fleeing was created by interventions of the US government, IMF, and World Bank over the past century, on behalf of multinational corporations in Central America and the brutal regimes that facilitate corporate power.[145] The story of the death trains, real and fictional, traces the necropolitical

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formations of global capitalism from the foundational violence of dispossession and enslavement in the construction of colonial railways, to the industrialization of mass murder and genocide during the Holocaust, to the precarity of Central American migrants fleeing conditions created by global capitalism. As accelerated capital accumulation threatens the existence of most life on earth, the metaphor of the "runaway train" seems an appropriate description for the global capitalist order and its necropolitical commitments.

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Conclusion: Infrastructural Brutalism and Brisantic Politics

> In the street fight politics will become, reason will not matter. Nor will facts. Politics will revert into brutal survivalism in an ultracompetitive environment.
>
> —Achille Mbembe

> Every undertaking of destratification (for example, going beyond the organism, plunging into a becoming) must therefore observe concrete rules of extreme caution: a too-sudden destratification may be suicidal, or turn cancerous. In other words, it will sometimes end in chaos, the void and destruction, and sometimes lock us back into the strata, which become more rigid still, losing their degrees of diversity, differentiation, and mobility.
>
> —Deleuze and Guattari

> Nothing short of an explosion will disintegrate the technological society: that is the vital issue.
>
> —Jacques Ellul

> Je pense donc je casse
>
> —slogan from the spring 2016 uprising in France

Often lost in discussions of capitalism and infrastructure is the preliminary violence of what Deborah Cowen calls "the social life of circulation," the "assembly of infrastructure and architecture achieved through land grabs, military actions, and dispossessions that are often the literal and figurative grounds for new logistics spaces."[1] What capitalists see as simply the smooth function of just-in-time and "lean" manufacturing systems are in fact profound forms of structural violence traceable to Indigenous erasure and the slave trade. Cowen argues for a definition of contemporary imperialism

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based on logistics, the marriage of state war and capitalist trade.[2] Logistics involves "not only 'transversal networks' but a suite of other spaces that underpin circulation—nodes, chokepoints, 'bunkers,' borders, and overlapping jurisdictions such as cities and states."[3] Cowen's perspective is indebted to Virilio, though he receives only a cursory mention in her book. Logistical spaces are biopolitical,[4] and Cowen recognizes that the commitment to the protection of capitalist circulation, framed as necessary for survival under this particular biopolitical regime, "has troubling implications; it naturalizes trade flows, casting disruption as a threat to life itself, ideologically buttressing active efforts to cast acts of piracy, indigenous blockades, and labor actions as matters of security subject to exceptional force."[5] While labor history is replete with strikes that attempted to interrupt logistical power in the form of the global commodity chain (GCC)—including "longshoremen on the US West Coast in the 1930s opposing Nazism and fascism by refusing to unload German and Italian goods, and more recent coordinated antiapartheid actions by maritime workers in the United States and Australia who effectively blocked South African shipping cargo in and out of ports beginning in the 1960s through the mid-1990s"[6]—arguably the contemporary scale of capitalism and the advanced stage of the ecological crisis should shift anticapitalist focus to the transport systems that deliver raw materials and manufactured goods, systems that scholars have identified as "particularly important potential choke points" in the global networks of capitalism.[7] Strikes or sabotage directed at railroads, oil pipelines, and paved roads have the potential to amplify disruption, in ways that individual factory occupations, for example, often do not. Strikes and blockades against oil refineries and fuel depots in France in 2016 and 2018 exhibit some of the possible capacities to interfere with capitalist flows. Of course, such actions require concomitant efforts to build social solidarity, or else they risk engendering a reactionary backlash. Infrastructural choke points, such as pipelines and ports, "represent vast sunk investments which are more difficult to relocate than factories or other processing facilities," and as such they can be "eminently vulnerable."[8] A central goal for anticapitalist revolutionaries, therefore, should be mapping the local logistical dynamics of capitalism in their region to determine where the most vulnerable local choke points in the GCC are. To understand the ecocidal order of global capitalist logistics is to understand "the contours of contemporary organized violence,"[9] but anticapitalist movements have been somewhat

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late to recognize this infrastructural fact of living with and against late capitalism.

While the counterglobalization movement of the past 30 years focused much of its tactical energies on temporary autonomous zones and other impermanent forms of solidarity and obstruction, global capitalism was engaged in the largest urbanization project in human history. This apparent contradiction—the disconnect between the capitalist emphasis on engineering megaprojects and unbounded urbanization, and the forms of resistance to capitalism that overlooked its infrastructural mandate, often choosing instead to work within the material conditions capitalism created—has been partially corrected in recent years with a focus within radical politics on infrastructure and logistics. Whether it takes the form of an airport blockade to prevent mass deportations of refugees, a highway blockade by Black Lives Matter to draw attention to police brutality, the resistance of Indigenous people to the construction of the Dakota Access Pipeline, or the sabotage of oil pipelines by Nigerian insurrectionists, infrastructure has become the focal point of radical politics around the world. The anarchist collective The Invisible Committee in its book *To Our Friends* proclaimed that "*power now resides in the infrastructures of this world*. Contemporary power is of an architectural and impersonal, and not a representative or personal, nature."[10] While it is an exaggeration to declare that power, without any qualifier, resides entirely in infrastructure, their emphasis on infrastructure effectively announces the elevated dominance of industrial capitalist machinery and the diminished capacity of various communist social agglomerations in this current moment. Revolutionary organizing from below remains essential to the defeat of capitalism,[11] but the temporal delimitations of rapidly deteriorating ecological conditions, and the spatial confinement of oppressed and surveilled working-class assemblies that have yet to develop adequate capacities of resistance against capitalism and its appendages, suggest that the revolution against infrastructural power might require "force multipliers," including acts of sabotage on a massive scale, to slow the pace of industrialized destruction in a relatively limited amount of time. "Force multiplier" is a military term that

> can refer to anything from military technology, to culture in the abstract, or culture in terms of news and entertainment communicated via radio, television, newspapers, and the Internet; gender and specifically relations between men and women; sexuality; law and legal enforcement systems; energy; food; education;

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"humanitarian aid" by non-governmental organizations; and even induced mental states where according to retired US General Colin Powell, "perpetual optimism is a force multiplier."[12]

In the context of the US military, force multiplication implies imperial domination via a more efficient use of resources; however, it is also a "recognition of limits, of force that is insufficient on its own and thus requires extensions, that is, multiples of itself."[13] While revolutionaries might take solace in the possibility that the US military, by its use of the term "force multiplier," is admitting its own contemporary limitations, here I want to emphasize how the concept relates to defeating infrastructural power from an antiauthoritarian perspective. To defeat infrastructural brutalism, or at least to slow it considerably over the next 10 to 20 years, will require the application of force multiplication by revolutionaries, because they are significantly outnumbered by authoritarians and possess a substantially inferior capacity for destruction compared with the state form and capitalism. The destructive capacity of the state form evolved from the barbed wire, poison gas, and machine guns of World War I to the atomic bombs, concentration camps, and firebombings of Dresden and Tokyo in World War II; in the wake of the Holocaust and Hiroshima, Michel Serres declared that "humanity is collectively suicidal,"[14] in the grip of a technoscientific order that "has been invaded through and through by the death instinct."[15] The capacity to slow industrial capitalism's ecological devastation and human subjugation requires a reorientation of radical politics toward infrastructure, sabotage, and the unpredictability of cascading destruction in an intensely interconnected world. Of course, sabotage is not a new idea or practice; it precedes the Industrial Revolution. Often, sabotage is defined in terms of the withdrawal of labor, and that remains an important tactic for anticapitalist resistance; however, the emphasis here is on sabotage as a form of destruction, a logistical intervention, because labor power has been attacked and diminished by capitalism over centuries, the ecological crisis presents an immediate and existential threat, and the multiplication of force is arguably greater when the appropriate technosocial conjunction is disrupted. The labor strike is easier for capitalism to alienate and ignore; but destruction of infrastructure or logistical interruption resonates in less predictable and manageable ways. Sabotage interpellates industrial subjectivities in more indiscriminate ways, which is both its advantage and its potential downfall as a tactic. "If the subject of the strike was the working

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class," write The Invisible Committee, "the subject of the blockade is whoever. It's anyone at all, anyone who takes a stand against the existing organization of the world."[16] Sabotage as destruction is riskier, and its effects are unsystematic. However, in addition to being a necessary amplification of marginalized voices, sabotage as destruction or logistical interruption enables people to "delay the catastrophe and begin to branch off in a less fatal direction."[17] That is, the interval provided by sabotage must be occupied by anarchist-communist assemblages that anticipate new needs and crises. Finally, destruction of infrastructure as a revolutionary tactic calls to mind the famous passage by Situationist author Raoul Vaneigem on the shock of revolutionary violence:

> The shock of freedom works miracles. Nothing can withstand it—not sickness of mind, not remorse, not guilt, not the sense of powerlessness, not the brutalization produced by the world of Power. When a water pipe broke in Pavlov's laboratory, not one of the dogs that survived the flood showed the slightest trace of their long conditioning. Could the high tide of social upheaval have less effect on people than a broken water pipe on dogs? Reich recommends provoking explosions of anger in neurotics with emotional blocks and muscular armouring. That kind of neurosis is, I think, particularly widespread today; it is, simply, what I call survival sickness. And the most coherent explosion of anger will very likely bear a suspicious resemblance to general insurrection. Three thousand years of darkness cannot withstand ten days of revolutionary violence.[18]

In the contemporary context, the "shock of freedom" has already been realized in the square occupations of recent years (Tahrir Square, Occupy, Indignados, etc.); arguably, these protests were effective because they managed to interrupt logistical terrain and make visible extracapitalist forms of existence. Indigenous resistance to the Dakota Access Pipeline (#NoDAPL), the Italian No TAV (Treno ad Alta Velocità) movement, and the struggle of the Indigenous Munduruku nation against the São Manoel hydroelectric dam in the Brazilian Amazon all represent revolutionary attempts to disrupt or destroy integral infrastructural components of what Virilio calls "a revolution in the means of destruction," or the transformation of capitalist production from an illusory form of progress to "the absolute identification of production with destruction."[19] This particular response to infrastructural brutalism is what I will call "brisantic politics."

In Richard Bach Jensen's pro-statist *The Battle Against Anarchist Terrorism: An International History, 1878–1934*, he argues that much of the mania over

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"anarchist terrorism" at the turn of the century, especially the image of the bomb-throwing anarchist, was generated by the collective anxieties of mass media and state officials, and that in fact anarchists were responsible for relatively few "terrorist" attacks during this period: "The anarchists organized very few conspiracies and many acts of 'anarchist' terrorism were not committed by the anarchists at all, but by nationalists, radicals, socialists, police spies, and the mentally unbalanced."[20] However, as a consequence of the collective perception of anarchism as (in my terms) a "brisantic" political force, new forms of policing involving international cooperation emerged. Jensen also argues, correctly, that political anarchism was a relatively marginalized phenomenon in terms of actual numbers of anarchists at the height of its popularity. To slow the suicidal pace of hyperindustrial society, anarchism today and allied political philosophies must become a brisantic political force on a global scale. "Brisance" is the term used to describe the shattering effect of an explosive; however, my use of the concept is not limited to this conventional definition but rather encompasses any assemblage capable of producing a shattering effect. Brisantic politics is not a philosophical analogy with the ironic anarchist rejoinder "make total destroy," but rather is a recognition of existing anarchism's inadequate capacity to "shatter" the suicidal infrastructure of industrial capitalism, especially the petromodern state form and its extractive industries, before the threshold of human survival is eclipsed. The history of brisantic politics is punctuated by the invention of dynamite in 1866, an important material in both the history of infrastructure (for blasting rock in the creation of tunnels and canals, for example) and of revolution. Brisantic politics emphasizes the destruction of objects, not violence against people or nonhuman animals; as such, the initial phase in the history of dynamite for political purposes was not singularly a brisantic epoch, because it included the use of dynamite against civilian populations as anarchists toward the end of the nineteenth century "hurled explosive devices into crowded cafés, religious processions, and operatic performances where they killed men, women, and children."[21] Among their successes was the September 16, 1920 bombing of Wall Street, carried out by Italian anarchist Mario Buda, which suspended trading for the first time in the history of the New York Stock Exchange. As Mike Davis writes in his history of the car bomb, "a poor immigrant with some stolen dynamite, a pile of scrap metal, and an old horse had managed to bring unprecedented terror to the

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inner sanctum of American capitalism."[22] To be clear, though: the explosive exploits of anarchism during its most active historical phase were not excessively deadly. Jensen contrasts the symbolic power of anarchism with its necropower: "While the symbolic power of and fear caused by all these anarchist bombings and assassinations were enormous, the number of casualties they produced was, by present day standards, modest in size."[23] The politics of brisance being advocated here are not intended to replicate terrorism that targets innocent people; instead, the issue for brisantic politics is to become a supplementary form of direct action against infrastructure to prevent industrial capitalism from killing most life on earth, and to give antiauthoritarian movements time to supplant capitalism with a political system that is not ecocidal.

Part of developing brisantic politics involves the identification of infrastructure that should not be sabotaged, a determination that must be sensitive to political and ecological consequences. Some infrastructure should not be sabotaged because it poses an obvious ecological risk; nuclear power plants, for example, must be expertly decommissioned—and all of them should be as soon as possible. To decommission a nuclear plant requires the disassembly of the structure, disposal of nuclear waste, and decontamination of the site, and can require decades to complete and cost over $1 billion.[24] Assumptions about the time and expense of decommissioning a nuclear reactor presume optimum conditions, as well, which could be very problematic in places where grid failures are common, a sustained energy crisis endures, or other political disruptions make decommissioning more challenging or impossible. While the typical nuclear power plant has a life of between 40 and 60 years, the potentially omnicidal nature of the technology should compel nations to decommission nuclear plants as soon as possible. With more than 500 nuclear reactors either built or under construction worldwide, a committed effort to decommission most or all of them would represent an epochal technosocial transformation of unparalleled scale and complexity, a depressing reality in the shadow of Three Mile Island, Chernobyl, and Fukushima. Also, as of 2018, the China National Nuclear Corporation was in talks with 40 countries regarding business opportunities related to nuclear power plants.

Unlike nuclear power plants, which should be decommissioned and not sabotaged, a somewhat ambiguous case for bristantic politics is that of oil and gas pipelines. Sabotage of an oil pipeline can produce a spill with

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serious ecological effects if the pipeline is operational, and the pipeline is unlikely to remain debilitated for long. It might be the case that attacking other aspects of the oil operation would be more effective at slowing extraction. Consider the case of the Niger Delta, what Michael Watts calls an "oil frontier," part of the global "oil assemblage" that includes two million kilometers of oil pipelines.[25] Nigeria is, in Watts's terms, "an archetypal petrostate"[26] and the largest producer of crude oil in Africa. While the activities of the Movement for the Emancipation of the Niger Delta (MEND) are among the most successful of any petro-insurgency in history—from 2005 to 2007, Nigerian oil revenues fell by an estimated 40 percent, and Shell lost over $10 billion, as a consequence of coordinated attacks on oil infrastructure—pipeline sabotage is accompanied by ecological and economic effects that impact the domestic population. The case of the Niger Delta raises at least two major questions for brisantic politics, then: If the most successful petro-insurgency in the world could not remove or shut down the oil corporations in the region, what lesson does this hold for the tactics used in other parts of the world in which efforts to disrupt oil capitalism are far less militant? And what prevents people living in petrostates, which are ecocidal arrangements both locally and globally, from destroying the oil infrastructure? One part of the answer to this question involves the ecological fallout of pipeline sabotage, the fact that oil infrastructure is profoundly toxic and its failure often causes death to nonhuman animals and plants: "Vandalised petroleum pipelines are known to cause oil leakages and spills, which have resulted in contamination of land and water resources, accumulate in animals and plants, forced people out of their previously productive land resources and caused ecological instability and ultimately deaths of plants, animals, and humans."[27] Instead of random bouts of destruction, then, brisantic politics returns the radical eye to a consideration of global logistical power, the necropolitical valences of operational, discontinuous, and ruined infrastructure assemblages, and the transversal connections among infrastructure and the poor and oppressed.

To introduce potential valences of brisantic politics and the object of destruction in an artistic context, I will consider Kelly Reichardt's 2013 film *Night Moves* and the novel it was accused of plagiarizing, Edward Abbey's *The Monkey Wrench Gang*. Reichardt's film embodies elements of the *anxiety of destruction*, a refusal in liberal and progressive communities to acknowledge the necessity of expanding the brisantic capacity of contemporary

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revolutionary politics based on the unpredictable agential cascade produced by broken or destroyed technosocial assemblages. While *Night Moves* has been compared, favorably and unfavorably, with *The Monkey Wrench Gang*, the film is different in one very important aspect: it does not share the radical enthusiasm for ecotage that made the novel famous and inspired the creation of Earth First!, but instead disavows ecotage for more liberal tactics.

The Anxiety of Destruction in Kelly Reichardt's *Night Moves*

One year prior to its premiere at the 2013 Toronto International Film Festival, Kelly Reichardt's *Night Moves* was sued by a rival film production for allegedly resembling too closely the narrative of Edward Abbey's classic novel *The Monkey Wrench Gang*, which was in the process of being adapted for the screen.[28] The company producing the rival film, Edward R. Pressman Film, wished to prevent Reichardt from filming her script. According to the lawsuit, Reichardt's film shared too many similarities with Abbey's classic novel:

> By way of example only, both works feature the targeting of a dam for destruction by means of ammonium fertilizer-laden boats. In the Novel, the principal bomb-maker is a beer-guzzling veteran who served overseas as a Green Beret, where he acquired his knowledge of explosives. The bomb-maker in "Night Moves" is a beer-guzzling veteran who served overseas as a U.S. Marine, where he acquired his knowledge of explosives. Both the Novel and "Night Moves" also feature a 20-something woman who starts out as a companion of another member of the group but develops a sexual relationship with the bomb-making veteran, despite his initial objections to her participation in the group's illegal activities.

However, the controversy surrounding *Night Moves* is particularly interesting for the ways in which that film does not resemble *The Monkey Wrench Gang*. Both stories are about radical environmentalists who plot to commit acts of ecotage; unlike the variety of ecotage presented in *The Monkey Wrench Gang*, *Night Moves* focuses solely on the destruction of a large dam using a boat filled with a fertilizer bomb. The group of young radicals in *Night Moves*—Josh, Dena, and Harmon, played by Jesse Eisenberg, Dakota Fanning, and Peter Sarsgaard—vaguely recall Bonnie Abzug, Seldom Seen Smith, Doc Sarvis, and George Hayduke from Abbey's novel. The character of Harmon, an ex-marine, obviously resembles Hayduke, the ex-Green Beret, but the resemblance ends with their respective military training.

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Hayduke, for example, is a former prisoner of war who experiences flashbacks of his time in Vietnam, while Harmon's service in Iraq receives minimal consideration. In Reichardt's film the dam is successfully destroyed, but a camper is accidentally killed in the ensuing flood. News of the accidental drowning emotionally paralyzes two of the accomplices, Josh and Dena, with fear, guilt, and paranoia and drives Harmon into hiding. Once Josh realizes that Dena is determined to confess the details of the crime to the authorities, he kills her in a paranoid panic. At the end of the film, we see Josh impulsively decide to apply for a job at a camping supplies store, after he has discarded his cell phone with the intention of evading the authorities. In the final shot, as he tries to fill out the job application form with details about his past and where he lives at present, he stares into a security mirror mounted in the corner of the store. In the reflection, a woman behind Josh operates her cell phone. It is a moment of powerful ambiguity.

Night Moves is a rare film because of its extended meditation on the destruction of an object, a large dam, and the subsequent implications for the human actors; such a storyline would normally be found in a combat film. In part, the film draws attention to Jane Bennett's observation about the "unstable cascade" of intentionalities in any assemblage. Human actors simply cannot be *entirely* accountable for the effects of their actions. Something always escapes the parameter of intended consequences. However, *Night Moves* shares very little of the enthusiasm for sabotage so pervasive in *The Monkey Wrench Gang*. From its opening scene, *Night Moves* exhibits sensitivity to what I would call the *anxiety of destruction*, an unease with shattering the material forms of industrial capitalism born of both the "agency panic"[29] that results from the imposition of industrial infrastructure, and the "unstable cascade" of intentionalities produced by the destruction of infrastructure. The first shot of the film is of a large dam's floodwater release valve. The valve opens while the camera watches from a static position overhead. Josh, the most ideologically committed character in the film, is watching the valve in operation, and Reichardt presents the audience with a simple metaphor of Josh's intensity of belief and moment of conviction. From Josh's point of view, we see the reservoir into which water from the valve is spilling; gradually, viewers are invited to meditate with Josh on the scale of infrastructure and its silent running. Dena, by comparison, is a dilettante; she is not enthralled by the dam, and her involvement in the act of sabotage is almost academic (in the pejorative sense of the term). As the two

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future saboteurs exit the scene, viewers are again encouraged to consider the scale of the dam, this time from behind barbed wire. The opening sequence of *Night Moves* contains few lines of dialogue, mixing ambient sounds with static cinematography. The structural violence of industrial capitalism, rarely contemplated on film, is in the opening frames of *Night Moves* treated with documentary fascination. In *The Monkey Wrench Gang*, by contrast, Doc Sarvis tells his Mormon accomplice, Seldom Seen Smith, "We're up against a *mad machine*, Seldom, which mangles mountains and devours men. Somebody has to try and stop it. That's us."[30] *Night Moves* is far more skeptical of its radicals and their tactics. Director Reichardt clearly sides with the organic farmers in the film, not the saboteurs, perhaps endorsing the liberal myth of the possibility of a peaceful transition between energy regimes in the context of oil capitalism. Edward Abbey obviously sides with his more audacious characters and their stated mission "to save the fucking wilderness," as George Hayduke puts it. "I don't know anything else worth saving. That's simple, right?" he adds.[31] Reichardt has her radicals attend a film screening in which ecological catastrophe is the subject. Instead of using this scene to support the necessity of the eventual ecotage, Reichardt prefers to linger in the rhetorical impotence of the Q&A session that is by now familiar to radicals who frequent such milieus. Reichardt's interest in the plot to destroy the dam is primarily driven by an exploration of the anxiety of destruction and its dramatic permutations, unlike Abbey's novel which obviously wants the reader to engage in prolific ecotage. Reichardt has conveyed in interviews her own ambivalence about the act of sabotage. For example, when an interviewer described the "personal motivations" of the characters in *Night Moves* as "unclear," Reichardt responded,

> I don't really think people know themselves that well. We all have ideas of what we believe, but these people [the characters in *Night Moves*] are surrounded by people that are so likeminded that there's never really a reason for them to talk about how they feel. They have absolute hard-driving feelings that are so ironclad that it's a problem for a while, until they pull off this big act—then the ambiguities of it all come into play and everything's less sure. Along with paranoia and isolation and the things that come with a radical act.[32]

Note Reichardt's assumption that radical direct action is necessarily accompanied by "paranoia and isolation." In *The Monkey Wrench Gang*, the act of destruction leads to paranoia and isolation for the saboteurs, but the book does not undermine its "save the wilderness" ethos as a result.

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Reichardt is not convinced of the validity of sabotage as a tactic. In her film, the anxiety of destruction precedes and undermines the object of destruction. The irony of Reichardt's position is that she does not believe in sabotage 40 years after *The Monkey Wrench Gang*, during which time industrial capitalism has expanded its concrete presence at an unprecedented rate and plunged the planet into the sixth mass extinction event in its history. If there were ever a moment in human history that demanded pervasive acts of destruction, now is that moment.

The Eco-Opportunist Documentary Film

By contrast with the brisantic imperative, most contemporary popular environmentalist agitprop, while willing to outline the extent of the ecological catastrophe, seems unwilling to name the primary cause of the catastrophe (capitalism) or the extreme actions required to avoid catastrophic ecological collapse. In an attempt to avoid overwhelming their audiences with bad news, several recent documentary films, for example, have elected to lower the expectations for meaningful action against the unfolding crises. Even beyond the realm of documentary films (some discussed below), there is a widespread belief that articulating the crises in detail only elicits a fatalistic response, and so one ought to be more strategic and share primarily optimistic stories about human "successes" against industrial suicide. Consider the pedagogical advice of scientist Diana Liverman. Liverman is a professor of geography, a 2014 Guggenheim Fellow, and a recipient of the Founder's Gold Medal of the Royal Geographical Society. Her online biography describes her as "an expert on the human dimensions of global environmental change."[33] In an August 20, 2014 op-ed for the *Washington Post*, Liverman described her efforts to teach university students about climate change. The problem, as she described it, was that she could not seem to "shock them out of complacency and into action."[34] Instead, many of her students left the class "feeling despondent and powerless." Liverman reminded herself of the research in her own field that "demonstrates that fearful people feel disempowered and less willing to act." And so, in her words, she decided to change her "narrative." She included "many more positive and hopeful examples and analyses" in her lectures. "Rather than lament the failures of US policy to reduce climate risks," she writes, "I point out how four decades of laws helped clean up our air and waterways, saving

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lives, money and ecosystems." Rather than "spend so much time on the environmental injustices suffered by the poor," she adds, "I talk more about how we have halved poverty and given millions access to safe water." Liverman links to the United Nations' Millennium Development Goals and uses the UN language of people becoming "agents of change." After teaching the revised, upbeat version of her class twice, she notes how "student evaluations are different. Now, students say things like 'I'm motivated to follow a green career' and 'My roommates are fed up with me telling them all the things they can do to save the planet.'" The change of attitude in the classroom and positive response from her students also inspired Liverman to invest in solar and water harvesting for her home, and to "actively support local political candidates with strong environmental records."

Liverman's op-ed illustrates, and advocates for, the rhetoric encouraged by leftists and liberals who condemn what is known as *catastrophism*, the doomsaying that has characterized much of the environmentalist literature of the past few decades. Some leftists believe the emphases on catastrophic ecological realities demoralize and demobilize potentially radical communities. As Doug Henwood writes in the foreword to the 2012 collection *Catastrophism*, "Wouldn't it be better to spin narratives of how humans are marvellously resourceful creatures who could do a lot better with the intellectual, social, and material resources we have? . . . Dystopia is for losers."[35] Prominent liberal and progressive filmmakers, much like Professor Liverman, have taken this advice seriously, but in their attempts to produce anticatastrophist messages they have understated the crises we face and promoted solutions that are dramatically inadequate, maybe even counterproductive. In other words, sometimes apathy is not the worst thing that could happen in a crisis. This section of the conclusion examines the recent documentary films *This Changes Everything* (2015), *Racing Extinction* (2015), *Chasing Ice* (2012), and *Chasing Coral* (2017), because they exemplify the most catastrophic ecological crises (climate change and mass extinction) and promote deeply problematic politics in response. At issue in these films and the debate over catastrophism is not the science of climate change or mass extinction, or the reality of a host of other existential ecological crises; catastrophists and their critics agree on the science. The disagreement is over what Eddie Yuen calls "the larger politics within which the science is couched."[36] Critics of catastrophism believe, based on some studies of the phenomenon, that once people are convinced of "apocalyptic

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scenarios" they become "more apathetic," and over time a "catastrophe fatigue" develops.[37]

There are many aspects of this discussion on which I agree with the critics of catastrophism. For example, Yuen accuses the Al Gore film *An Inconvenient Truth* of following "compelling evidence for ecological collapse with woefully inadequate injunctions to green consumption or lobbying of political representatives."[38] This is accurate, and the same could be said of *This Changes Everything*, *Racing Extinction*, and the other films under consideration below; most of these films have been made after the debate over catastrophism, and appear to be deliberate responses to it, in their overall aesthetic and the solutions they promote. The past decade, especially with the emergence of YouTube, has seen an abundance of doomer documentaries, a genre Imre Szeman refers to as "eco-apocalypse discourses" in which "the deep political and economic investments in oil are assessed, the dire social-political-environmental consequences of inaction on oil are laid out, and because it becomes obvious that avoiding these results would require changing everything, apocalyptic narratives and statistics are trotted out."[39] Several peak oil films released in the wake of the US invasion of Iraq framed life under oil capitalism as too dependent on a rapidly depleting resource, with a common message that societal collapse is near and few alternatives are available. In documentaries such as *The End of Suburbia* (2004), *A Crude Awakening* (2006), *Crude Impact* (2006), *What a Way to Go: Life at the End of Empire* (2007), *Sweet Crude* (2009), and *Collapse* (2009), filmmakers both amateur and professional developed narratives that often combined ecological collapse with peak oil fatalism. At the heart of this trend was an attempt to untangle the apparent paradox Gerry Canavan describes: "either we have peak oil and the entire world suffers a tumultuous transition to post-cheap-oil economics, or else there's plenty of oil left for us to permanently destroy the global climate through excess carbon emissions."[40] There is no utopian outcome, no "good" Anthropocene,[41] and our commitment to oil capitalism has only ensured that many potential escape routes are blocked by infrastructural overdevelopment and capitalism's rapacious colonization of the planet. Peak oil doomerism has temporarily ceded to films concerned with climate change, the other half of Canavan's paradox, largely because of a global oil glut created by a combination of market prices, geopolitical maneuvering, and the success of fracking-related technologies; by June 2017, a record amount of oil, 111.9 million barrels, was sitting in tankers

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at sea.[42] The abundance of oil globally will subside, and perhaps once again documentarians will produce popular films about the obstacles to changing what oil capitalism has created. For now, however, it seems general interest has shifted to the ecological catastrophe generated by almost two centuries of oil capitalism.

In the context of oil abundance, a new documentary discourse is emerging, one that takes seriously the criticism of catastrophism, as well as what Yuen rightly calls "catastrophe fatigue," and attempts to address environmental catastrophe by shielding viewers from its complexities and instead emphasizing optimism based on the presumption of human ingenuity, a vague understanding of the collective capacity for change, and, most important, an almost apologetic recognition of the existence of capitalism (if it is recognized at all), the primary force driving ecological collapse. *Racing Extinction*, for example, does not even mention the word "capitalism," even though the mass extinction event in progress is demonstrably a by-product of global capitalism. If the ecoapocalyptic narratives of the preceding decade were too focused on the scale of ecological destruction and the complexity of system change necessary to reverse or slow that destruction, then the new leftist ecodocumentaries, what I would call *eco-opportunist* narratives, make a series of gestures that understate the crises and promote inadequate solutions, all in the name of generating some kind of audience response, *any* kind of audience response.

Racing Extinction

The opening scenes of *Racing Extinction* establish a clear trajectory for the film's point of view. This is a film in which the views of "humanity" are equated with the editorial choices of the *Financial Times* (one talking head expresses surprise that the *Financial Times* relegated a story about mass extinction to page six) and high technology is the principal means for saving humanity from mass extinction. The film never mentions the word "capitalism." It apparently sees no correlation between the worldview of the *Financial Times* and the sixth mass extinction event in the history of the planet, even though the neoliberal phase of capitalism, its most successful global surge, corresponds precisely with what scientists call the Great Acceleration, "the most rapid transformation of the human relationship with the natural world in the history of humankind."[43] When you meet the film's

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alleged heroes, who include Elon Musk and a race car driver, you realize why the connection between capitalism and mass extinction is never made. Perhaps part of the reason for this particular narrative selection also has to do with the film's producers, which include the Li Ka Shing Foundation. As of 2014, Li Ka Shing was the richest person in Asia, with a net worth of over $30 billion. Li made his fortune in a variety of business ventures, which include plastics manufacturing, cement production, construction, airports, and an ownership stake in several container ports around the world. He is also the majority shareholder in Husky Energy. *Racing Extinction* is therefore coproduced by a man whose entire professional life has been devoted to the destruction of the oceans.

Racing Extinction does not avoid some of the ominous scenarios of mass extinction, but it accompanies those with a confident statement by one of the film's protagonists: "It's like we're living in the age of dinosaurs, but we can do something about it." The analogy might not make sense, for several reasons: for one thing, if this is indeed a mass extinction event we are living in, then there is no way to reverse its general course. Paleontologist Doug Erwin, who does not believe the current planetary situation is a mass extinction event, contradicts *Racing Extinction*'s primary invitation to its audience to save very visible and majestic species: "If it's actually true we're in a sixth mass extinction, then there's no point in conservation biology," he says.[44] According to Erwin, an expert in past mass extinctions, a mass extinction represents a "network" failure that would eliminate almost all life on earth. At the moment, he says, we are approaching a mass extinction: "Yeah, everything's fine until it's not. And then everything goes to hell." In other words, the analogy with the dinosaurs, presented early in *Racing Extinction*, makes no sense because even a species with the ingenuity of *Homo sapiens* could not have saved the dinosaurs from the Cretaceous-Paleogene extinction event, which eliminated three-quarters of the species on earth; ingenuity cannot reverse a mass extinction. *Racing Extinction* extends the analogy with the Cretaceous-Paleogene mass extinction to declare the source of the current mass extinction: "Humanity is the asteroid," says a voice from offscreen. Of course, "humanity" is not the asteroid. Overconsumptive, industrialized, capitalist humanity is the asteroid, and, even then, comparing humanity with an asteroid creates a faulty comparison of a natural disaster (the asteroid) with a definitively unnatural one (a human economic system). Most of humanity does not drive cars, produce synthetic chemicals,

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or test atomic bombs. As Eddie Yuen writes, "The status quo of capitalist production of unnecessary commodities and services for the global elites and 'middle classes' is the ongoing catastrophe that must be addressed."[45] *Racing Extinction* notably avoids the primary causes of mass extinction, and instead condemns *all* of humanity.

The heroes of *Racing Extinction* are photographers and first-world technologists. The central assumption of both is that visibility correlates with capacity for change. If you can show the problem, the problem will be solved. Of course, if this were true, the world would have turned its back on nuclear energy, polar bears would not be endangered, and war would be a thing of the past. *Racing Extinction* simplifies both the crisis and the solution, with a myopic sense of the relationship between communication and social change. The model of success for *Racing Extinction* does not involve replacing capitalism with a less ecocidal economic system; instead, the film advocates for capitalism as the answer to the mass extinction driven by capitalism itself. Shawn Heinrichs, who formerly worked in finance and international business development, is presented in *Racing Extinction* as a "marine conservationist" and one of the exemplars of the film's proposed solutions to the extinction crisis. Heinrichs is credited with transforming the shark hunting area of Isla Mujeres in the Caribbean into a shark watching location for ecotourism. After making the case for swimming with the sharks instead of hunting them, Heinrichs adds, "It's just simple economics." For *Racing Extinction*, the way to reduce an extinction crisis that sees species dying in numbers up to 10,000 times the normal background rate of extinction is to promote the economic system that gave us the Great Acceleration. In a subsequent sequence, Heinrichs asks, "Often people say, 'How can one person make a difference?'" The film then transitions to a public service announcement involving Chinese basketball superstar Yao Ming. In this announcement aimed at curbing the Chinese appetite for shark fin soup is a combination of the film's favorite messages. First, consumer choices are what drive change; "Remember, when the buying stops, the killing can too" (the message from the public service announcement) is a wonderfully ironic message for a film that does not ask its first-world viewers to confront the structural violence of capitalism. Second, once again the film makes the correlation between witnessing and activism, this time by demonstrating how a television commercial with an internationally known athlete can affect consumption habits (not a lesson that applies

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to everyone, obviously). Later in the film, the fetish of witnessing reaches a crescendo of cognitive dissonance, as an "environmentalist" race car driver responds to her critics by saying if she were driving a bicycle and not a race car, she would not have "75 million" people watching her. And third, this sequence represents one of several examples in the film in which the focus is on Asia; only briefly does the film pause to remonstrate with the West for its contributions to planetary mass extinctions, even though the Columbian exchange was, prior to global warming, the largest anthropogenic environmental disaster in human history. For the most part, this is a film featuring white, first-world men as talking heads addressing businesses in Hong Kong, mainland China, and Indonesia who traffic in endangered species. The focus on Asia is likely a consequence of where the featured photographers already work, and perhaps of where the film gets some of its funding, but for a documentary whose primary audience is in the West on the Discovery Channel and at various film festivals, the choice to depict onscreen almost exclusively Asian fishermen and traders slaughtering endangered species such as sharks and manta rays, while leaving out an extensive history of Western deforestation and plunder of the oceans, produces a weirdly orientalist visual grammar. At one point, for example, there is a particularly gruesome sequence in which Indonesian fishermen hunt manta rays while Shawn Heinrichs chokes back tears as he narrates his horror at the unfolding savagery.

Toward the end of the film, famous primatologist Jane Goodall says, "Without hope, people fall into apathy." This message, as well as the message that incremental changes are better than no change at all, is repeated throughout the film and is clearly its guiding ethos, a message very much consonant with the critics of catastrophism. *Racing Extinction* oscillates between dramatic statistics of mass extinction and the "green" capitalists who are retrofitting skyscrapers or turning shark hunting into ecotourism. The entrepreneur who retrofitted the Empire State Building says, "The best way to move the needle, when people are talking about the environment, is the bottom line." This sentiment echoes the "simple economics" statement of Shawn Heinrichs and reaffirms the film's commitment to capitalist metrics. When viewers combine the two central messages of *Racing Extinction*—that incremental change and economic (capitalist) metrics are the solution to the extinction crisis—they receive a profoundly misguided set of instructions for responding to an extinction crisis that threatens to

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erase at least half of all species by the end of this century; however, clearly, this message lowers the bar to entry for those who want to be perceived as environmentalists, and therefore gives the appearance of solving the dilemma of catastrophism.

Toward the end of *Racing Extinction*, Heinrichs appears on screen in a moment of triumph and declares, "Most people say you can't beat money . . . with just hope and inspiration." His statement is followed by one of the celebrated photographers in the film demonstrating how the photos they have taken of manta rays have produced a change because "people get it" when they see the problem represented visually. It is this scene that appears to fold the argument of *Racing Extinction* in on itself. The audience has been told repeatedly that the way to address environmental issues is "the bottom line" and "simple economics." The audience has also been told that witnessing is powerful and that witnessing with high technology is perhaps the most powerful form of advocacy. Money loses, apparently, because images of manta rays have been shared with government regulators who declare the manta ray off limits to the market. Images trump money, at least in a limited way that the filmmakers use to illustrate the efficacy of their chosen form of advocacy. The photographers at the center of the film are champions for an endangered species, as a result, but the incantations about market metrics and environmentalism are undermined. In order to prove that "hope" *can* beat money—that is, in order to maintain the critique of catastrophism—the filmmakers must contradict themselves and their free market preferences.

A common feature of eco-opportunist documentaries is their desire to appeal to audiences beyond the assumed progressive vanguard of North American film festivals. One could, I suppose, argue that the inclusion of an environmentalist race car driver is such an attempt, a gesture beyond the choir. Later in the film, the environmentalist race car driver is behind the wheel of a car designed by Wall Street's favorite techno-entrepreneur, Elon Musk, as they tour New York City using a car-mounted overhead projector to transmit images of endangered species onto the surfaces of various buildings, including the United Nations headquarters. The rousing finale of the film affirms the value of the "small choices we make each day," once again encouraging the apathetic North American viewer to accept the idea that individual consumer choices, and not collective action, are all that is required to combat what the film itself has portrayed as an existential

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threat to humanity that could very well cause our extinction in a matter of a century. Instead of the ecoapocalyptic narrative in which the crises created by industrial capitalism are global, complex, and intractable, the eco-opportunist narrative is ebullient and optimistic because the mass extinction crisis only requires that we as individuals eat less meat, install solar panels, and drive one of Elon Musk's Tesla vehicles into a latte-filled future. The problem with *Racing Extinction* is not that all of its recommendations are bad ideas, but that it sets the bar so low that success in its terms would not come close to solving the extinction crisis; in fact, there is a strong likelihood that following only the film's solutions would simply extend the life of capitalist ecocide, deferring the mass extinction event for a few years or decades. The film's muddled message ultimately seems irrelevant within the context of its stunning imagery and exhilarating musical crescendo that implores viewers to "start with one thing." This is not pragmatism. This is technolibertarian fantasy.

This Changes Everything

Compared with *Racing Extinction*, *This Changes Everything* is in many ways successful at combining the message of hope with at least a semblance of adequate solutions. Avi Lewis's film is of course based on the Naomi Klein bestseller of the same title. From the opening scene of the film, it is clear that the critique of catastrophism is very much on the mind of the filmmakers. "Can I be honest with you?" begins Klein's narration. "I've always kinda hated films about climate change. . . . Is it really possible to be bored by the end of the world?" The first gesture in the film is to identify the jaded first-world viewer and attempt to thwart that person's cynicism. Klein says we are told that the cause of climate change is the innate greed of human beings, and "if that's true, then there is no hope." Immediately, before any facts about climate change have been dispensed, *This Changes Everything* sets out to counter the effects of catastrophism. "What if the real problem is a story, one we've been telling ourselves for 400 years?" Klein asks rhetorically, in a form of cultural critique that sounds similar to 1990s-era poststructuralism and remnants of the linguistic turn in the humanities. This massive and complex problem of climate change can be solved, according to Klein, if we just change the narrative. She reached a comparable conclusion in her popular 2007 book *The Shock Doctrine*, in

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which she argued that learning the history of disaster capitalism was the best way to shield a populace against its effects. With the documentary *This Changes Everything*, the opening gambit is once again about changing narratives; however, given how substantially the infrastructure of oil capitalism has expanded in the past century, even if one looks at only the time that has passed since the publication of her *No Logo* in 1999, Klein's emphasis on changing the narrative—rather than, say, disrupting or destroying the infrastructure of capitalism's supply chains—seems somewhat quaint. In particular, in that opening scene Klein's voiceover draws our attention to the incredible duration of the colonial narrative of mastery over nature. What makes the film think we, or even many of *us*, can change such a durable and materially embedded narrative in a matter of decades or less?

In the same way that *Racing Extinction* condemns *all* human beings for mass extinction, *This Changes Everything* uses the royal *we* to describe the origins of climate change, instead of more accurately historicizing climate change primarily as a consequence of European colonialism and industrial capitalism. In her book, Klein uses similar language when assessing an aggregate human capacity for change: "It seems to me that if humans are capable of sacrificing this much collective benefit in the name of stabilizing an economic system that makes daily life so much more expensive and precarious [the austerity agenda], then surely humans should be capable of making some important lifestyle changes in the interest of stabilizing the physical systems upon which all of life depends."[46] In this passage, Klein is trying to use the rhetoric of the capitalist austerity agenda against capitalism, as if to say, "Calls for collective sacrifice on behalf of the austerity agenda presume we are capable of such sacrifice, so why not apply that capacity to saving the planet?" The intended target of such rhetoric, much as with the opening gambit of the film, is not the dedicated leftist but the skeptics in the audience, especially the conservatives. Of course, the question is not whether "humans" are capable of changing economic systems, but whether the overconsumptive and exploitive capitalist class can be brought to heel by a socialist revolution. That is, Klein's liberal use of "we" and "humans" in the film obscures significant social divisions based on economics, gender, race, colonialism, and other oppressive structures.

By referencing the "leaders" of "most" nations as sharing a consensus that the world must not pass the 2° Celsius above baseline warming cautioned by the IPCC, *This Changes Everything* strangely avoids using the

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scientific consensus to make the same point. More troubling is the emphasis the film places on nation-states as the solution for climate change, as in the section that deals with Hurricane Sandy, when the state form has accompanied capitalism at every stage of this catastrophe. How many decades of failed climate talks will it take for Klein, Bill McKibben, and 350.org to realize that the state form collaborated with capitalism in the conquests of the Columbian exchange and every petrodollar produced since the beginning of oil capitalism? The only viable option to slow catastrophic climate change involves rapid decolonization and deindustrialization, and neither of these projects can be accomplished through the state form; the state form is actively complicit in the twin disasters of the colonial project and industrial capitalism.

The scene in which a Greek comrade in Halkidiki questions whether identifying capitalism as the primary problem will help "the struggle" condenses all of the anxieties of the left and its critique of catastrophism into a single, reluctant admission. "What is the core problem?" Klein asks the Greek comrade. "Do you want me to state it on camera?" she responds, giggling nervously. "Yeah, I would say it's the economic system," she says, then stumbles. "Capitalism, I guess." "You're not sure if you should say that on camera?" asks Klein. "No. I don't know if it helps the struggle," the comrade laughs in response. While Klein and Lewis deserve credit for actually naming capitalism as the source of the climate crisis, in her book and in their film, the admission in the film doesn't happen until about halfway through, and the filmmakers allow its identification to be framed sheepishly by a speaker who is not sure whether saying the word "capitalism" will help defeat it. In her book, Klein uses the phrase "unregulated capitalism" to describe what she sees as the enemy of the environmentalist movement. In public appearances, Klein echoes Doug Henwood's belief, articulated in the foreword to the *Catastrophism* anthology, that "it doesn't seem fruitful to argue that there's no way to save the earth without ending capitalism."[47] Klein wrote an online column in response to early critics of her book, in which she makes the same point: we can fight climate change before ending capitalism.[48] Her defense of her book, when writers on the left and the right accused it of calling for the end of capitalism, essentially denies that she is anticapitalist, even though her book makes the case about capitalism and the environment that anarchists and Marxists made decades earlier:

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> I argue forcefully that capitalist logic and neoliberal policies are sabotaging the actions required to avert catastrophe. But I have never said that we need to "slay," "ditch" or "dismantle" capitalism in order to fight climate change. And I most certainly didn't say we need to do so *first*. Indeed I say the opposite, very early on in the book (page 25), precisely because it would be so dangerous to make such a purist claim.

The sentence "And I most certainly didn't say we need to do so *first*" conveys a specific meaning to the sentence that precedes it: Klein is clearly saying that she does not believe capitalism must be abolished. The idea that humanity could fight climate change without dismantling the ecocidal system that created climate change is the kind of logic eco-opportunists engage in when trying to lower the bar for environmental activism, and when attempting to make their books and films accessible to a liberal audience in the Global North. Slowing climate change is clearly a greater priority than ending capitalism. But can you do the first thing without doing the second? And exactly how much capitalism does Klein believe we can live with and still fight climate change? And how many people will interpret this strategy as liberal reformism that makes excuses for the continued existence of capitalism? The film *This Changes Everything* does little to convince viewers that Klein is advocating for revolutionary change, rather than liberal reform. At one point, Klein describes the role of right-wing think tanks in the extension of the neoliberal agenda. The outcome is described in decidedly liberal terms: "Governments wither, the middle class dissolves, and profits soar." Klein mourns the dissolution of the state form and the so-called middle class, a liberal invention to mask the class war by which capitalism is defined.

This Changes Everything does contain some coverage of necessary and exciting forms of resistance, from the "environmentalism of the poor" in India to the resistance of Indigenous people in Canada. By focusing on problematic elements in the film, I am not denying that it has value; I am simply trying to condense a critique of the film into a small space. When the film encounters what might be the biggest obstacle in the fight against climate change, China, Klein acknowledges that China is not a "model" country; in fact, it's "more like a battlefield." The section on China is where *This Changes Everything* pulls punches, reserves some of the most demoralizing statistics and tendencies for the sake of preserving a viewer with hope. It is also in the section on China, very late in the film, that Klein finally

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frames the crisis of climate change in the terms it deserves, but the terms the film has been reluctant to offer: "capitalism versus the climate." Is withholding the principal culprit in this story a canny strategy for inviting the skeptical liberal or conservative to watch over an hour of a documentary about climate change? The earlier mention of capitalism was from a Greek comrade who sheepishly offered the word and was not sure if it would help to name the problem. This kind of dodging of the real issue is a staple of the eco-opportunist documentary, almost a parallel of the very easy way in which catastrophism documentaries discuss the intellectual cul-de-sac one finds when trying to solve the problem of peak oil. The eco-opportunist ethos returns at the end of *This Changes Everything*, to frame global warming as an opportunity: "So here's the big question: What if global warming isn't *only* a crisis?" Klein asks provocatively. "What if it's the best chance we're every going to get to build a better world?" The eco-opportunist strays so far from the catastrophist that global warming becomes an opportunity, not simply a crisis.

Chasing Ice and *Chasing Coral*

Chasing Ice (2012) and *Chasing Coral* (2017) are both directed by Jeff Orlowski, so it is not surprising that they share the same aesthetic and political valences. Both films contain some of the most incredible images of natural phenomena ever recorded. A substantial portion of these films is devoted to the technical challenges of obtaining photographs of glacial melt and coral bleaching. The goal of each film is a form of witnessing that the filmmakers believe will activate radical ecoactivism necessary to reverse the respective crises. The techno-utopian narrative trajectory emphasizes the passion and technical skill of the first-world technicians and scientists engaged in capturing rare images. The narrative structure matches that of *Racing Extinction*, and in *Chasing Coral* an important subplot involves a former ad man, similar to Shawn Heinrichs's character arc in *Racing Extinction*. Characteristic of the eco-opportunist film, then, is the redemption of the capitalist, but the word "capitalism" must not be uttered in the film, and the solution to the ecological crises created by capitalism must also involve capitalism. In *Chasing Ice*, former Shell Oil employee Richard Ward declares that the images of the melting glaciers were a revelation to him, never mind the fact that Exxon knew about the effects of global warming almost 40

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years ago and chose to invest millions in forms of climate denial,[49] and that Shell Oil produced a film in 1991 that warned of the dangers of climate change but continued to conduct its business without concern for its role in greenhouse gas emissions.[50] Eco-opportunist films substitute ineffectual individual defections of capitalists for systemic change that might have a chance of reducing significantly the ecological impact of capitalism.

Chasing Ice follows environmental photographer James Balog in his quest to capture images of the effects of global warming. This is a noble goal, and those images will likely contribute to various forms of public education. Toward the end of the film, Balog is seen presenting to the 2009 United Nations Copenhagen Climate Change Conference; presumably, the filmmakers believe this type of political arena is where significant emissions cuts can be accomplished. The conference in 2009 ended with "all references to 1.5C [the intended maximum level of warming as a target for emissions cuts] in past drafts . . . removed at the last minute," while "the earlier 2050 goal of reducing global CO_2 emissions by 80% was also dropped."[51] Future conferences marked similar failures, with no legally binding emissions targets that could limit warming to under 2° C. As suggested above, the IPCC target of 2° C no longer seems tenable, and more likely scenarios predict warming of anywhere from 2° to 6° by the end of the century. *Chasing Coral* presents a similarly catastrophic future for coral reefs, with the probable outcome that most reefs will be dead in 30 years. Like *Chasing Ice* and *Racing Extinction*, there is no mention of capitalism in *Chasing Coral*, and the solutions proposed at the end of the film direct the viewer to the film's website. The downloadable pamphlet of recommended actions includes many sensible activities: petition political leaders to support "clean energy and clean jobs"; commit to reducing your carbon footprint; join local NGOs such as 350.org and the Sierra Club; and participate in a number of groups dedicated to supporting coral reefs. None of these ideas is necessarily inappropriate; however, each by itself is potentially problematic and certainly does not address the overlapping systems of oppression within capitalism. For example, an appeal to a political leader is easily ignored; the state is structurally a hostage of capitalist influence. Individual commitments to carbon reduction do not address massive institutional abuses (militaries, oil companies, etc.). NGOs routinely greenwash corporate exploitation of the environment and buttress capitalist oppression by providing a recuperative form of charity for what might otherwise be revolutionary struggle.

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By not identifying the structural source of the environmental crises, and by providing piecemeal, reform-oriented solutions, eco-opportunist documentaries such as *Racing Extinction*, *This Changes Everything*, *Chasing Ice*, and *Chasing Coral* might be more inviting to a broader audience, and might even overcome some of the problems with films that preached catastrophism, but in understating the crises and providing insufficient solutions they can be worse than unproductive—they can be counterproductive.

"Less Is the Wisdom of the Future": Imagining Brisance in a Future Made of Intercontinental Fixed-Link Infrastructure

The American historian Howard Mumford Jones observed of the epoch in which oil extraction on an industrial scale emerged, "The discovery that energy could be channeled into vast and profitable projects of destruction created in the era a kind of fierce, adolescent joy in smashing things."[52] Over a century later, a substantial chunk of the natural world has been smashed, cut down, excavated, removed, and buried in concrete. The "adolescent joy in smashing things" has been owned and perpetrated primarily by agents of the state and capitalism, and they have constructed a thanatocracy whose technoscientific apparatus "tranquilly inhabits the instinct of destruction and annihilation."[53] Capitalism and the state form dominate the means of destruction and construction; they are the uncontested global brisantic powers. Scholars such as Christopher F. Jones, Anique Hommels, and Keller Easterling have contributed ideas important to understanding the parameters of brisantic politics, but none of these theorists situates destructive practices as an essential component of resistance to infrastructural brutalism. While they recognize the enduring quality of unprecedented urban expansion, they often seek to counteract the hegemonic order with forms of design rather than transversal acts of ruination. Design that reduces infrastructural brutalism is important, but extralegal acts of destruction will be essential. Jones's history of energy regime transition in the mid-Atlantic region of the United States between 1830 and 1920 illustrates important lessons about the persistence of industrial infrastructure. If our current global condition is defined by nonrenewable energy sources that are dramatically pushing the climate beyond a condition in which humans can survive, then obviously we must accelerate a transition to a renewable energy regime and dismantle the carbon-intensive infrastructure so that it does not experience

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a resurgence in 10, 20, or 50 years, or ever. For context, consider that in 2016 worldwide oil consumption rose by 1.6 percent to a new record high; that is, despite stories in liberal and progressive media celebrating widespread adoption of renewable energy, the worldwide trend remains in favor of oil and gas, with a minor decline in coal consumption.[54] Significantly, as Christopher Jones reminds us, "Energy transitions are not natural or inevitable, but once they begin, they can be extremely durable."[55] Most liberal and progressive analyses of oil capitalism do not appreciate its durability. They assume the mere existence of alternative energy regimes will presage a peaceful transition away from carbon-intensive energy. But this presumes the oil industry will be willing to leave $100 trillion in future profits on the table, according to a Citigroup report,[56] to meet the climate goals of the Paris Agreement, which the oil industry has no legal obligation to observe. And as Bill McKibben wrote in 2012: "The five biggest oil companies have made more than $1 trillion in profits since the millennium—there's simply too much money to be made on oil and gas and coal to go chasing after zephyrs and sunbeams."[57] In 2012, British environmentalist and Green Party advocate Jonathon Porritt recognized the intransigence of the oil industry, after many years of trying to work with it: "We came to the conclusion that it was impossible for today's oil and gas majors to adapt in a timely and intelligent way to the imperative of radical decarbonisation."[58] Climate scientists have also predicted very little chance of human societies keeping global warming in check: A study in 2017 suggested there is almost no chance—a 5 percent chance, to be precise—that the world will keep global warming below the IPCC's recommended target of 2° C warming above baseline.[59] In his history of energy transformation in the United States, Jones discusses how the "sunk costs of infrastructure exerted a logic that encouraged boosters to create demand when it did not exist";[60] those sunk costs of carbon-intensive infrastructure continue to produce a "logic" of perpetual growth on a global scale, with profound political, environmental, and social consequences. There is no reason to believe the obduracy of oil capitalism's infrastructure is something that can be addressed strictly in market-based terms and without a large-scale, militant opposition. The liberal myth of education as a social panacea must also be confronted with a stark reminder of how centuries of industrial capitalism created a world in pervasive ecological decline: "Our planet's entry into the Anthropocene did not follow a frenetic modernism ignorant of the environment but, on

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the contrary, decades of reflection and concern as to the human degradation of our Earth."[61] Knowledge of the ecological destruction of the industrial revolution has been available for centuries. The ecological collapse will be slowed or reversed by the courage of a militant minority, not by the achievement of a critical mass in popular opinion.

At the same time, of course, radical decarbonization will not be a possibility without tactics beyond sabotage, and this is where the ideas of Hommels and, especially, Easterling are important to outline. Hommels, for example, draws attention to the variable "obduracy" of urban assemblages and sites of "unbuilding activities,"[62] and Easterling maintains that acts of building can also be acts of unbuilding. Easterling describes a relational understanding of construction, which she calls "subtraction," that reminds urban designers that "most buildings trigger a subtraction of some sort."[63] In this view, building should be seen as "an ecology of removal and addition" that foregrounds "the instrumentality of interplay and interdependence."[64] Since urban designers have substantial influence over the shape and substance of capitalist "development," Easterling's concept of "subtraction" deserves widespread dissemination. While brisantic politics emphasize the capacity to shatter necropolitical agglomerations, *subtraction* is situated within "a moment in a set of exchanges and advances, aggressions and attritions that are part of most active organizations,"[65] and is therefore not simply about producing material absence or ruin. In this "set of exchanges," for example, the debris from a demolition or a construction can be treated as part of a "material stream" and become part of "an economy of rearrangement and reuse."[66] Easterling's theory of subtraction works effectively as a type of reform for capitalist development schemes, but preventing infrastructural brutalism from driving most life on earth to extinction, at this late stage of the death spiral, will require widespread, extralegal direct action with a brisantic capability.

The spaces of infrastructural brutalism are often defined by impervious surfaces—roads, sidewalks, parking lots, and rooftops, commonly paved surfaces of asphalt or concrete, often concentrated in urban areas. In cities in the United States, up to 40 percent of the landscape is impervious.[67] Impervious surfaces prevent rainwater infiltration into the soil and thereby become primary sources of polluted runoff and excessive flooding. The 2017 flooding of Houston by Hurricane Harvey, for example, was exacerbated by the development of the Houston area: "Local officials did not do

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enough to preserve native grasses, set aside open spaces or improve drainage. . . . Elsewhere, roads, parking lots, homes and businesses covered over wetlands and prairies that absorb flood waters."[68] In the wake of the most extreme rain event in US history, urban planners once again noted how reducing what capitalism calls development is "one of the best ways to manage urban flooding."[69] Unfortunately, paved landscapes continue to proliferate as the global urban population increases. There are many possible responses to the spread of impervious surfaces, in addition to the obvious choice to oppose urban development and redefine economic terms such as "value" and "wealth."[70] For example, for several years both governments and autonomous communities have been involved in forms of depaving. A 2016 study in the United States by the Transportation Research Board of the National Academies found "that the practice of converting paved roads to unpaved is relatively widespread; recent road conversion projects were identified in 27 states on mainly rural, low-volume roads that were paved when asphalt and construction prices were low"; in other words, many of the roads being depaved should not have been paved in the first place.[71] Depaving low-traffic roads produces many economic and environmental benefits. In addition, communities in cities such as Portland and Calgary have engaged in depaving projects to improve local water quality and reconnect people with natural spaces.[72] However, the more radical and necessary forms of brisantic politics will lack state regulation and the quality of popular pedestrian acceptance. Some impervious surfaces will be dismantled because a local, autonomous community decides it is necessary to do so. The tactical variability of this form of brisantic politics, attuned to the infinite discrepancies of technosocial concatenations, proliferates and manifests like a sentiment instead of a program. Brisantic politics begin with an understanding, a dream of dismantling depicted by poet Sina Queyras in her brilliant collection *Expressway*. Queyras's poems are in conversation with Wordsworth and Blake, looking back at the English romantics from the modern expressway that exists "Smoothing each nuisance of wild, each terrifying / Quirk of land, uneven, forlorn paths."[73] From this place, nature is "nostalgia."[74] The collection ends with a section called "Three Dreams of the Expressway," and the first "dream" is of "dismantling":

> The men build and the women dismantle.
> On this day the women appear one by one,
> Despite our best theories, they drop their

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Laptops and iPods, they leave their magazines,
They step down from elliptical trainers, out of
The boxing ring, tummies flat and minds sharp.
They move out of the domestic sphere, they
Move away from the office towers, they come
Down to the expressways with pickaxes, they come
With hammers, they come, suddenly clear,
Suddenly swinging hammers, they say, *This*
Is a metaphor too unwieldy, they say, *This*
Is a symbol that has undone us, they say,
This is the beginning of unmaking, they say,
The future is in doing the right thing, the future
Of the economy is in undoing, they say.[75]

This dream is a dream of social and structural revolution: the subversion of reactionary gender roles (the women "appear . . . Despite our best theories"), the abandonment of bourgeois disciplining of the self ("They step down from elliptical trainers"), and the embrace of working-class instrumentation ("Suddenly swinging hammers") to attack the impervious surface of the expressway and capitalist realism. Revolutionary recomposition in the age of infrastructural brutalism must embrace unmaking, undoing, shattering, brisance. As Queyras concludes her collection, "More is destruction. / Less is the wisdom of the future. / . . . Go forth and undo harm."[76]

An obvious problem with reducing radical tactics to the work of sabotage and preventing new industrial capitalist infrastructure from being built is that infrastructure can often be fixed quickly, and new structures are difficult to prevent once money and public opinion have momentum, in the absence of an occupying force; however, notable contemporary forms of resistance gesture at strategies for overcoming the capitalist zeal for ecocidal destruction. The ZAD, an occupation of land near the French city of Nantes designated in 1974 for the construction of an airport, and the NoTAV, a territorial struggle over the projected Turin-to-Lyon high-speed railway line, represent opposition to infrastructural megaprojects that emphasizes "proximity to and involvement with the means of subsistence" and the establishment of "a lived intimacy with the territory."[77] Kristin Ross reminds us that Kropotkin foregrounded these elements as strategic essentials for revolution. The ZAD, the *zone d'aménagement différé* that became a *zone à défendre* in 2008, is a form of occupation popularized in France, which now boasts several ZADs. The No TAV, or No Treno ad Alta Velocità,

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represents an occupation and "a political leaning, that of seeing in the opposition to infrastructures a space for thwarting the inexorable expansion of a nightmarish world."[78] The politics of the occupiers vary, but their everyday life integrates with the struggle to defy capitalist destruction. Ross sees the struggles of the ZAD and NoTAV as one side of "a war between two dueling logics, two argumentations, two knowledges, two futures" that she calls "the 'airworld' versus the territory."[79] The airworld represents the capitalist circuits of commodity production and circulation that seek to eliminate all "barriers" to the transit of products using air travel, "free trade" zones, and complete disregard for local ecologies. Ross contextualizes the territorial struggles in the age of the airworld:

> If what matters for the airworld is a smooth and seamless transit between substitutable spaces, for the territory what matters has everything to do with a logic of difference and possibility, autonomy and self-determination: the perpetuation of the possibilities of common life that place-based social relations can create, even amidst a striking diversity of beliefs. Where once the territory's fight was with the airport or the train-line, it is no longer with high-speed transport per se, but with its world: a world of class-division that identifies human progress with economic growth and defines human needs in terms of markets and the submission of all the world's resources to capital. Preventing one's territory from becoming a mere node in a global capitalist system, a space of pure transit where people do nothing more than pass through, is a way of stabilizing in time—and perhaps even, with luck, a lifetime—a way of life that lies at least partially outside of and against the state and the market.[80]

While airports and high-speed rail lines attempt to abolish space in the service of capital, territorial struggles can begin to reclaim space in service of humans, nonhuman animals, and local ecologies. Key to territorial struggles, what separates them from many other forms of protest, is that the struggle against infrastructure becomes a way of life and not simply a letter to the editor, a visit to a local political representative, or an occasional protest march. Territorial struggles get in the way of infrastructure projects, sometimes for decades. In addition to the ZAD and NoTAV movements, other territorial struggles have developed communities in opposition to industrial infrastructure. For example, in northern British Columbia, Canada, the Unist'ot'en clan of the Wet'suwet'en people built a protest community in the path of proposed oil and gas pipelines. In this case, the territorial struggle involves Indigenous people with a claim to the land on which the protest was constructed. Although often referred to as a protest camp,

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Unist'ot'en representative Freda Huson says it is more properly described as a "community," with permanent structures and residents.[81] Since 2009, Unist'ot'en resistance has contributed to the cancellation of five pipeline projects. In February 2020, as this manuscript was nearing completion, an RCMP raid on unceded Wet'suwet'en territory, the second such raid in a year, provoked solidarity rail blockades across Canada by other First Nations and their allies. The RCMP were trying to clear a path for a 670-kilometer pipeline opposed by Wet'suwet'en hereditary chiefs. The ensuing rail blockades shut down freight train traffic across Canada, proving the effectiveness of logistical intervention. For Indigenous communities, territorial opposition to capitalist infrastructure can also contribute to what Leanne Betasamosake Simpson calls "a resurgence of Indigenous intellectual systems and a reclamation of the context in which those systems operate," part of the essential process of decolonization because it "places people back on the land in a context that is conducive to resurgence and mobilization."[82]

The next phase of infrastructural brutalism, typified but not exclusively represented by China's Belt and Road Initiative, continues a legacy that commenced centuries ago: planetary infrastructure, which will provide continuous grounded transportation between continents. While many examples of planetary infrastructure of the "ungrounded" kind already exist—in satellite communications networks and air travel—the category of intercontinental fixed-link infrastructure, such as bridges or tunnels that connect continents, is less common but has the potential to reify forms of capital accumulation in more permanent ways than intercontinental infrastructures based on radio telecommunications signals or carbon-intensive travel. To mention a few notable instances of fixed-link intercontinental infrastructure, some at the proposal stage and others completed: the Eurasia Tunnel in Turkey connects Kazlıçeşme (in Europe) with Göztepe (in Asia) via a 14.5-kilometer tunnel under the Bosphorus;[83] the Bering Strait Tunnel, to connect Asia and North America, was first proposed in the 1890s, approved by Tsar Nicholas II, and then went dormant until 2011; a related project is the rumored railway line from China to Russia, then under the Bering Strait to the US and Canada; the Korea-Japan Friendship Tunnel would connect Busan and Fukuoka with a combined undersea and island travel distance of over 200 kilometers; the Sicily-Tunisia Tunnel would connect Europe and Africa, with an additional bridge from Sicily to Reggio di Calabria in mainland Italy; and the Trans Global Highway, a proposal of entrepreneur Frank

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Didik, which would connect existing highways, pipelines, and communications cables to form a continuous global lattice of grounded infrastructure.[84] Proposals for global grounded infrastructure networks existed in the nineteenth century and included Colorado Governor William Gilpin's 1890 tract *Cosmopolitan Railway: Compacting and Fusing Together All the World's Continents*. In the 1920s, German architect Herman Sörgel proposed building a hydroelectric dam across the Strait of Gibraltar which would drain the Mediterranean enough to create new land for Europe and become part of an infrastructural bridge with Africa. He called this project Atlantropa, and decades later it would reappear in fiction such as Philip K. Dick's *The Man in the High Castle* (1962) and Arthur C. Clarke's *Rendezvous with Rama* (1973). Atlantropa preceded actual engineering megaprojects such as the Hoover Dam and the Tennessee Valley Authority by a few years and shared with those projects ambitious expectations of social engineering.[85] Sörgel's idea emerged from a postwar German anxiety about cultural decline, something he wished to fix with access to an energy source perceived to be clean and limitless.[86] Atlantropa was profoundly imperialist and racist, an infrastructural vision of the transformation of Africa's geography and environment for the service of European society.[87] The living space created by damming the Mediterranean was considered a peaceful alternative to the nascent Nazi prescription of military conquest in the name of *Lebensraum*. Sörgel attempted to ingratiate himself with the Nazi leadership: in 1938, he published *Die drei großen "A"* (*The Three Great A's*) and used a quote from *Mein Kampf* to illustrate the importance of the fascist countries (Germany and Italy) becoming "the womb of Atlantropa."[88] The Nazis eventually had to engage in a propaganda war with public support for Atlantropa, because it did not correspond with their vision for Europe:

> Sörgel's public campaigns for Atlantropa initially did not bother the Nazi authorities until Sörgel began earning both publicity and, to some extent, interest among architectural circles elsewhere in Europe in the mid to late 1930s. Hitler's propaganda arm went so far as to produce a film committed to discrediting Sörgel and Atlantropa. The half-hour film, entitled *Ein Meer Versinkt/A Sea Sinks* ominously portrays the head of every state abutting the Mediterranean Sea sitting around a gigantic model of Sörgel's scheme. The heads of Arab states are conspicuous in their *thiyaab* (robes) and seem to hold equanimity in the proceedings with their northerly neighbours. A metaphorical expert explains the project to the leaders and, in a flash of truly formidable drama, illustrates how a tiny bomb detonated on the Gibraltar Dam would unleash havoc on each nation. . . . Sörgel's

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> pan-national, pan-continental scheme, even with its inherent mechanisms of power and subordination, was not consonant to the expansionist vision of National Socialism. The film is an unprecedented attack on an individual architect, intended to win over the hearts and minds of German citizens and to convince them of the peril of Sörgel's degenerative cultural scheme.[89]

In his popular 1939 novel *Amadeus*, Swiss author John Knittel celebrated Sörgel and Atlantropa.[90] The idea of Atlantropa circulated to a greater extent through popular culture than it did in the form of official discourses, and represented in various texts and images what historian Peter Christensen calls "a Christian-Islamic-Pagan Pangea within a last-gasp imperialist impulse."[91]

Brisantic art will help to imagine the tactics and strategies that can fracture the assemblages of planetary infrastructure before the ossified layers of hyperindustrial capitalism entomb most life in a concrete island from which escape is almost impossible. Not all brisantic art foregrounds successful forms of shattering in the manner of *The Monkey Wrench Gang*, however; in some cases, artistic texts can provide a better understanding of the *anxiety of destruction*, the fear of ruination that haunts hyperindustrial reification as in Reichardt's film *Night Moves*. Similarly, prolific science fiction author Harry Harrison's 1972 novel *Tunnel through the Deeps* posits an alternative history of the world in which the British defeat the United States in the American Revolution, and George Washington is executed for treason. The British Empire of 1973 wants to build a transatlantic tunnel in the form of floating tubes. The tunnel project is complicated by the politics of industry and nationalism, but most of all it is interrupted by sabotage. In the absence of sabotage, Harrison's characters describe the tunnel as part of a cosmopolitan utopia built on planetary infrastructure:

> It will then be possible for a passenger to board a train at the Pacific port of Provideniya at the end of the Trans-Siberian Railroad and thence to proceed by train across Siberia, Russia, and Europe, under the Atlantic, across America and connect with the Trans-Canada Railroad to Alaska, there to finish his journey once more on the shores of the Pacific. After a journey around at least ninety-nine percent of the Earth's circumference at this point.[92]

The proposal of the tunnel even follows the capitalist narrative of economic stimulation currently being promoted in the real world: "It was then that the tunnel project was first voiced, a project large enough to affect and stimulate the entire economy of both Britain and the American

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colonies."[93] A descendant of George Washington is chosen to lead the project, not despite his genealogy but because he is "a colonial, one of their own people, so the operation has a definite American ring to it."[94] The same comprador logic echoes from every contemporary neoliberal boardroom and campaign headquarters. Captain Augustine Washington is the engineer selected to guide construction of the tunnel, and he must confront multiple attempts to sabotage it that culminate in a conspiracy of "a strong organization that is actively operating against" it: "They are well financed and ruthless and will stop at nothing."[95] In Harrison's book, the enemies of the transatlantic tunnel are not ecosaboteurs but competing imperialists and industrialists. When the architect of the sabotage is finally revealed, he is a "respected financier from Boston and a member of the New York branch of the Transatlantic Tunnel Board of Directors."[96] Behind the plot to destroy the tunnel are powerful opponents of the British Empire, not those who might despise colonialism: "Shipping interests, foreign countries, all the men of power and men of evil who felt that the tunnel would do them no good, the countries who wish England and the empire ill-will at all times. A consortium of crime such as has never been seen before."[97] After the plot to sabotage the tunnel is thwarted, the tunnel finishes construction and the maiden journey of the train witnesses a scene of colonial fantasy in New York City:

> What a microcosm of the new world this little park had become as people flocked in for this wonderful occasion, a slice of history revealed with the original owners there, the Lenni-Lenape Indians, a few Dutchmen—for they had been intrepid enough to attempt a colony here before the English overwhelmed them—Scotch and Irish who then came to settle, as well as immigrants from all the countries of Europe. And Indians and more Indians, Algonquin of all the five nations in their ceremonial finery of tall-feathered headdresses; Blackfeet and Crow from the west, Pueblo and Pima from even farther west, Aztec and Inca from the south. . . . All was as it should be and the world seemed a wonderful place.[98]

This cosmopolitan vision of oppressed and oppressors united under empire—and all because of a tunnel that makes travel across the ocean more efficient—marks the apotheosis of liberal globalization, as described by Mattelart.[99] Harrison's celebration of empire as the conduit for planetary infrastructure and world peace effaces all forms of oppression such an arrangement entails, in service of a vision of infrastructure as a sacrosanct material composition concomitant with the state form. The anxiety

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of destruction, in this case, emanates from the synoptic position of the state and its adherents, unlike in *Night Moves*, which portrays marginalized actors experiencing the trauma of the cascading effects of destruction.

As Deleuze and Guattari caution, a society that destratifies too fast risks a suicidal condition; the madness of the Khmer Rouge's Year Zero and its accelerated deindustrialization provides a historical cautionary tale. At the same time, as most observers are aware, little time remains for a global deceleration capable of averting near-term human extinction. This brisantic deceleration will not be the result of nation-states or capitalism suddenly reversing centuries of exploitation, dispossession, accumulation, and destruction. A small but militant minority might be able to slow the capitalist suicide, to expand the window of opportunity for anticapitalist social movement building. An essential first step in this process must involve reorienting the dominant perspective on infrastructure as an inherently life-sustaining assemblage, and instead to see its necropolitical features and identify the most salient conjunctions, which are also likely to be logistical weaknesses. What role will art play in the confrontation with infrastructural brutalism? This book has already suggested several possibilities. Amitav Ghosh, in his meditation on literature and climate change, asks, "Is it possible that the arts and literature of this time will one day be remembered not for their daring, nor for their championing of freedom, but rather because of their complicity in the Great Derangement?"[100] His answer is yes, and he has little confidence that this will change. And yet it must. Climate change alone, as Ghosh says, is "perhaps the most important question ever to confront *culture* in the broadest sense—for let us make no mistake: the climate crisis is also a crisis of culture, and thus of the imagination."[101] The artists have begun to imagine the necropolitical contours of infrastructure, so let us hope they continue to do so, and let us hope we have the courage to respond appropriately. Let us begin to see infrastructure as the Ojibwe poet David Groulx writes in "Widening the Highway on the Rez":

> The wind that winter
> threw up the highway
> its long tongue
> licking the houses and bony shore
>
> Its teeth clamped down
> on the Indians, dogs and their houses

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Its flayed skin
heaped in front of *Our Lady of the Highway Church*

The fish scatter
the moose flee
silence escapes

and only crows and vultures gather
on this brand new corpse. . . .

Lebensraum is made
from my grandmother's land

and the dead animals on the new
highway gather[102]

Indigenous artists know better than most that capitalism is, in the words of Achille Mbembe, "the equivalent of a giant necropolis. It rests on the traffic of the dead and human bones."[103] Every new infrastructure project initiated by industrial capitalism generates a "brand new corpse." While a substantial component of brisantic politics must involve the destruction or retrofitting of choke points in the global capitalist infrastructure networks, a concomitant project of learning precolonial forms of infrastructure that were eminently more sustainable is also essential. Deena Rymhs concludes her excellent study of roads and violence in Indigenous art from North America with a reminder of "the worlds, ecologies, and longer histories of living with the earth that prefigure our relatively compressed interval of carbon capitalism," such as the precolonial oolichan trails of the Pacific Northwest Coast Indigenous people.[104] For Rymhs, considering precolonial infrastructures provides an opportunity to "think for a moment outside of the totalizing world of oil."[105] This type of investigation is necessary, as capitalists and ecomodernists on the left bet on technophilic fables as miraculous saviors that will somehow transcend historical momentum and ideological commitments. To tame climate change, for example, establishment scientific projections depend on scenarios involving "negative emissions," the capacity to remove carbon from the air using technology beyond the natural carbon sinks. These technological solutions include "carbon capture and storage" and "bioenergy with carbon capture and storage," both solutions that are, "according to a raft of recent [scientific] papers, . . . something close to fantasy."[106]

However, the contemporary assemblage of high technology, pervasive toxic synthetics, state capitalist formations, and ecological decline means

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we should not fetishize precolonial infrastructures or neglect modern knowledge systems that will be necessary in the decomposition of modern necropolitics. A hybrid world of modernist technical specialization and precolonial knowledges will be necessary and probable for the foreseeable future, for as long as we have a future. Only specific forms of expertise can disassemble a nuclear power plant, and only a different kind of expertise can build and maintain precolonial infrastructures. The hybrid knowledge of the brisantic project will likely never see a complete epistemological decolonization, given the durability of what modernity has birthed and the knowledge necessary to abort thanatocratic creations on the horizon. Leaking pipelines, overflowing lakes of toxic tailings, and imploding nuclear reactors are the future. Consider, for example, that as of 2017 there were 160 nuclear reactors shut down and 291 more set to close in the coming decade, and that each project of decommissioning a nuclear reactor can produce on average about 60,000 tons of radioactive waste, cost billions of dollars, and take decades to complete, with no clear location for the waste.[107] The US Department of Energy reports 54 tons of surplus plutonium in its possession, with a radioactive half-life of 24,000 years and no plan to store it.[108] It is also essential to remember that the cost and duration estimates for decommissioning these reactors and storing the waste are being made under optimal circumstances. What happens when there are sustained energy crises, natural disasters, or political chaos that interfere with the decommissioning of reactors or storage of waste? Cascading impacts of climate change in particular will be difficult to assess and predict. Some proponents of nuclear power advocate this form of energy because of its lower greenhouse gas emissions, for example, and generally ignore the accumulation of toxic waste or dangers of operational nuclear reactors. But in August 2018, France had to shut down temporarily seven of its nuclear reactors because a record-breaking heatwave covered Europe. The plants use water from and return water to local rivers to cool the reactors, but under such extreme conditions the returning water could overheat the river and cause mass fish die-offs.[109] Given the projections for the future of the climate in Europe, which include an increase in the number of heatwaves,[110] there is at least one more reason to avoid nuclear power. Working through this attenuated catastrophe will require a combination of traditional and modern knowledges. For a localized example of Indigenous knowledge and science working together, consider the 2019 calculation by engineers from

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Imperial College London that the now-abandoned precolonial canals constructed by the Chavin and Wari Indigenous peoples on the slopes of the Andes Mountains in what is now Peru might provide a solution for the management of Peru's water supply in this arid region.[111]

We are locked in a time-sensitive competition: Can we abolish power before it abolishes us? Can we diminish or reverse the encroachment of infrastructural brutalism, before various ecological crises cross a threshold beyond our capacity for repair? "It is power itself that has to be abolished," Jean Baudrillard once wrote in what might be his most anarchistic sentiment, "and not just in the refusal *to be dominated*, which is the essence of all traditional struggles, but equally and as violently in the refusal *to dominate*. For domination implies both these things, and if there were the same violence or energy in the refusal to dominate, we would long ago have stopped dreaming of revolution."[112] The key ingredient in contemporary domination is infrastructure: the network of networks that enables mass surveillance; the roads and rails that accelerate colonial extraction; the large dams that erase human cultures and disrupt riparian ecosystems. The discussions in this book of infrastructural brutalism through the lens of art—drowned town fiction, road movies, energy landscape photography, and death train narratives—provide points of departure for brisantic politics, sometimes explicit calls to action, sometimes subtle intimations that individual readers will recognize based on the idiosyncrasies of their personal experiences. Some art inspires people to unbuild necropolitical structures. Some art warns against the construction of future necropower. What is essential in the current epoch is that more people realize the necropolitics of infrastructure, to see and practice beyond the neoliberal consensus that decaying infrastructure must always be repaired and that an absence of infrastructure is always an opportunity for so-called development. What we deter or destroy today will mean more to our collective future than anything we build or repair.

For Lewis Mumford, the famous sociologist and philosopher of technology, mining "originally set the pattern for later modes of mechanization by its callous disregard for human factors, by its indifference to the pollution and destruction of the neighboring environment, by its concentration upon the physicochemical processes for obtaining the desired metal or fuel, and above all by its topographic and mental isolation from the organic world of the farmer and the craftsman, and the spiritual world

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of the Church, the University, and the City." The destructive capacity of mining "closely resembles warfare," and its organization of labor and environmental devastation migrated to the manufacturing industries of capitalism.[113] Extractive industries that remove oil and gas, minerals, metals, and other materials from the earth presaged the ecocidal relationship with the land embedded in all capitalist enterprises and colonial conquests. When Christopher Columbus reached what are now the Dominican Republic and Haiti he wrote, "there must be an infinite number of things that would be profitable" in such lands.[114] In the centuries that followed the arrival of European settlers, "a global system of extraction, exchange, and production" was organized for the benefit of colonial powers.[115] Decolonization must begin with a militant opposition to contemporary mining corporations that extract close to 80 billion tons of biomass every year. If we are to have a different relationship with each other, we must have a different relationship with the land first. Other recent scholars of infrastructure and radical politics have reached conclusions that are worth repeating here. Manu Karuka concludes his history of the transcontinental railroad, Indigenous nations, and Chinese workers by confidently reiterating what anticolonial Indigenous feminists have said before: today, we have a choice between decolonization and mass extinction.[116] Nick Estes ends his discussion of the Pick-Sloan Plan hydro projects and the Standing Rock uprising against the Dakota Access Pipeline with the declarative, "For the earth to live, capitalism must die."[117] To these commendable studies and sentiments, I wish to add, in the words of Anishinaabe poet and scholar Leanne Betasamosake Simpson, "meet me at the underpass / rebellion is / on her way."[118]

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are generally not opposed to expertise (though they are almost universally opposed to nuclear power). As Bakunin famously said, "In the matter of boots, I refer to the authority of the bootmaker; concerning houses, canals, or railroads, I consult that of the architect or engineer. For such or such special knowledge I apply to such or such a savant. But I allow neither the bootmaker nor the architect nor the savant to impose his authority upon me. I listen to them freely and with all the respect merited by their intelligence, their character, their knowledge, reserving always my incontestable right of criticism and censure. I do not content myself with consulting authority in any special branch; I consult several; I compare their opinions and choose that which seems to me the soundest" (as quoted in http://www.panarchy.org/bakunin/authority.1871.html). Harvey's portrait of incapable anarchists convening in an inefficient manner to solve a serious crisis at a nuclear power plant is therefore misguided.

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